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On the Internal and External use of the Nitro-Muriatic Acid, in the Cure of Diseases. By H. SCOTT, M. D.

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I HAVE been assured by several members of this society, of which I have the honour to be an associate, that some account of the way in which I have long been in the habit of employing the nitro-muriatic acid, would be acceptable to this learned body. Such an account has become the more necessary, as many persons have begun to employ the remedy in question with little information as to its effects or its management. It is capable of producing more remarkable changes in the human body, and with less disturbance of its functions, than any other substance with which I am acquainted.

I had not been long in India before I had reason to think that the oxides of mercury were of the utmost importance in the treatment of many diseases of that climate, such as chronic and acute hepatitis, dysentery, flux, asthma, and of some other complaints. I became convinced, for instance, that in obviating abscess of the liver, we can trust to nothing but the mercurial preparations. Whenever the habit is impregnated with mercury to a certain degree, which the state of the sali-

vary glands, and other constitutional effects, sufficiently indicate, the patient remains quite free from the danger of abscess. I have long thought that when such a misfortune does occur, it is to be attributed to want of medical skill, or to the application of the remedy at too late a period, after some change of structure, necessarily ending in abscess, had taken place. Though blood-letting, blistering, purging, together with the other parts of the antiphlogistic treatment, may occasionally be useful, they are not to be put in competition with a proper use of the oxides of mercury, without which we can seldom remove any severe affection of the liver, whether it be acute or chronic.

Entertaining this opinion of mercurial preparations, I was yet very frequently much dissatisfied with their effects. Patients labouring under hepatitis were often freed from the risk of abscess; but a state of such extreme weakness, perhaps, had been induced by the disease, or by the remedies employed to subdue it, that, on a recurrence of the disorder, they resolved to endure all the miseries attending it, rather than return to a treatment which they had found to be so distressing. In this resolution they might persist for a time, but at last would fly to the remedy as a less evil than that by which they were kept in a state of suffering so exquisite and so hopeless.

In my first trials with the nitric acid as a substitute for mercury, and indeed for a number of years, I used the acid procured from impure Bengal saltpetre, by means of alum. The acid thus obtained was really a mixture of the nitric and muriatic acids, the latter being derived from the muriates of soda, of lime, and of magnesia, with which that salt is so largely contaminated. I long believed that all the good effects, which I saw this acid produce, arose from the *nitric acid* alone, and I took measures at last to get it in a state of very considerable purity*. In the effects, however, of my purer acid, I was sadly disappointed; for although it did by no means cease to produce some salutary consequences, yet they were less decisive, less valuable, and of a different kind. I now reflect with satisfaction, that I published at that time an account of my mate-

* See No. II. of the Journal of Science and the Arts, 1816.

rials and my process, so that the public had the same means of forming a judgment, that I myself possessed.

In a paper on the nitric acid, printed in India, in the year 1796, and reprinted in London, I gave an account of my process, and of the materials used for obtaining it, to which I added the following words. "As the nitre that I have used contained about six per cent. of sea salt," (here I seem to have taken no account of the other muriates,) "it will be evident that the acid which I obtained is not a pure acid of nitre, but it is a mixture of the acid of nitre and oxygenated muriatic acid, or it is an aqua regia, in which the marine acid bears a small proportion to the acid of nitre; as this is precisely the case with the acid of nitre from Apothecaries' Hall, with the effects of which I was well acquainted from experience, I was less anxious to separate from my nitre the whole of the marine salt. This is the acid that I used in all my trials. It is more agreeable to the taste than the acid of Europe, and more salutary, if I mistake not, in the living body."

I left India in very bad health, and long remained ill in this country. During this period I often reflected on my experience with the acids, and resolved, as soon as an opportunity should occur, to return to the use of the nitro-muriatic acid, and to satisfy my mind on the subject from further observation. Above a year ago I came to London, and had an opportunity of getting the nitro-muriatic acid employed to a considerable extent. At first, I mixed three parts of nitrous acid with one of muriatic, in order to imitate the acid I had used in India. Of late, however, I have employed the acids in equal weights, and I give a preference to this proportion; but there may be others still more efficacious which time will discover.

Although I had reason in India to be satisfied with the general effects derived from this acid, yet considerable inconvenience attended its internal use. If it were not given with great caution, it injured the enamel of the teeth, though not their roots, as mercury does. Even in small quantities, it disagreed with some stomachs, and few individuals indeed could continue it sufficiently long, or in a sufficient quantity to remove from the system the symptoms of secondary syphilis. These difficulties made me anxious to ascertain whether or not the acid

externally applied would produce good effects. I accordingly employed it in this manner in various cases,* and I immersed my own body up to the chin in a bath of this acid, sufficiently diluted with water. I fortunately have preserved the memoranda that I made at the time, of which the following is a copy.

"*Bombay*, 27th *April*, 1798. I bathed to-day in an acid bath, which was merely acidulous. It covered the whole body below the head. I staid in it for half an hour, and it was nearly of the temperature of the body. I feel no particular effect from this bath. It is fully as pleasant as water, and cleanses the skin like a soap.

" *April* 28. I bathed again to-day, keeping the bath at the same temperature, or making it rather higher, and of the same strength with regard to acid. I staid in it half an hour. I still feel no material effect from the bath. Pulse after bathing 76°. The only apparent action of the acid is on such animal matters as are unprotected by life, with which it forms an acid soap. Would it not deprive feathers of their oily smell?

" 29th. Bathed again, and continued as before for half an hour in the bath. To-day the bath was hardly so hot as the body. About half an hour after bathing yesterday, I became sensible of an odd sensation about my gums, my jaws, and my teeth.

" 30th. Bathed again, and staid half an hour in the bath. It was rather warmer than my body. Since yesterday I have been sensible of some uneasiness in my throat on swallowing. I feel a disposition to salivation at times, but I am otherwise well. My gums both above and below, are somewhat reddened. I was for some time disposed to ascribe these effects to imagination, but they have continued all this day, and leave me no doubt of their reality. I am in good health.

" *May* 1st. Since yesterday I have felt some pain in my throat, especially on swallowing. This pain seems to follow the course of the œsophagus. During the whole of this forenoon I had a sense of *burning* over the roof of my mouth, and down the gullet. This sensation is like what arises from hav-

* See a letter published in July 1797, and republished in Dr. Beddoes's Collection.

ing chewed an acrid vegetable substance, and is so unpleasant, that unless it leave me by to-morrow, I shall bathe no more. To-day I bathed as usual, staying in the bath for half an hour. It has been to-day, and in general, so acid, as to make my skin smart a good deal in many places.

"2d. My mouth, &c. though not in the least ulcerated, is somewhat pained. I am sufficiently convinced of the great power of this bath, and shall bathe no more. My digestion is improved, and I feel that my liver, unclogged by disease, is doing its office with facility, which for some time past has not been the case with me.

"6th. I have not bathed again, but I still feel the effects of the bath in my mouth. My appetite is now good, and I sleep with tranquillity, which I had not done of late. With all this my pulse is quicker than usual, and I am sensible of some degree of languor. It is, however, to be observed, that the weather is very hot; the thermometer being, during the day, in the shade, from 92 to 96 degrees of Fahrenheit.

"In order to get a delicate test for acidity or alkalescency, I have been accustomed to rub the red petals of the *hibiscus rosa sinensis* on white paper, where they leave a blue-coloured stain. I observed when under the influence of the bath, the urine no longer turns this colour red, but destroys it altogether.

"*June* 6th. For a fortnight after giving up the bath, I was sensible of some of its effects about my mouth, and my pulse remained too quick. I am now remarkably well. My liver seems to be sound, and I have experienced a happier change than I ever did from mercury."

After this I used the nitro-muriatic bath in a variety of cases, and often with agreeable results. I now wrote another letter, giving an account of its powers: this letter was published in London, but it attracted very little attention, being tried by few individuals. When I came to London, and had it in my power to have the nitro-muriatic bath employed for various states of disease, I was, as may be supposed, very anxious to know if it could be as commonly applicable in this climate as it is within the tropics. I have been much pleased to discover that it gives here the very same results that I formerly derived from it; nor are the maladies for which it may bring re-

lief, less general in this country than in India. On the contrary, they seem to be still more abundant.

The acid that I have used of late is the nitro-muriatic; and it is formed by mixing together equal parts of the nitrous, or nitric acid, and muriatic acid. If these acids be in the state of concentration that they usually possess in the shops, and if the quantities be considerable, a great volume of gas is evolved on their coming into contact, which taints every part of a house, is extremely hurtful to the lungs, and disagreeable to the smell. To avoid all this inconvenience, I put a quantity of water, at least equal in bulk to both the acids, into a bottle, and I add the acids to it separately. This method does not only prevent the unpleasant odour, but it tends to retain the chlorine on which its effects depend. It is well known that the nitro-muriatic acid acts very readily on the metals and earth; nothing therefore but glass, or extremely well glazed vessels of porcelain, should be used to contain it. Wooden tubs for bathing answer very well, and they should always be made *as small as possible*, compatible with their holding the body, or the limbs that we wish to expose to the bath. From their being small we save acid, and are able to heat the bath with ease. In India I have often exposed the whole body below the head to this bath; but here I have been satisfied in general by keeping the legs and feet exposed to it. In order to warm the baths after the first time, I have commonly made a third or a fourth part of it be thrown away, and the loss replaced by boiling water, and a proportional quantity of acid. To save the expenditure of acid, I have occasionally warmed a portion of the bath in porcelain vessels placed near the fire, but I fear this may diminish its effects.

It is no easy matter to give directions with regard to the degree of acidity of the bath. I have commonly made it about as strong as very weak vinegar, trusting to the taste alone. The strength should be regulated by the degree of irritability of the patient's skin. I may say, that although I like to know that it is strong enough to prick the skin a very little, after being exposed to it from fifteen to thirty minutes, yet I believe that even such an effect as this is unnecessary.

The time, too, of remaining in the bath, in order to produce

the greatest effect, is a matter of doubt; I have kept the legs and feet exposed to it for half an hour or more; but with more delicate people not above one-half, or one-third of that time. I have repeated these baths daily, or even twice or thrice a day.

I must now observe that the mere sponging the skin with nitro-muriatic acid, sufficiently diluted with water, gives rise to the very same effects with bathing, and is more easily applied. Fifteen or twenty minutes may be employed in the sponging, though I have found that a much less time does produce very material effects. When the bathing or sponging is carried to a considerable extent, and when the system is much under its influence, a sense of weakness comes on occasionally, some nervous irritation and restlessness are felt, a taste of metal (generally compared to that of copper) becomes sensible; a sense of pain occurs in some part of the palate or mouth, which is not permanent, but comes and soon goes off again. At length little specks or small ulcerations, extending no deeper than the cuticle, are seen on the interior surface of the mouth, and over the tongue, so that some degree of excoriation or rawness is at last produced. This is attended by a considerable discharge of saliva, with an increase of the feeling of lowness or depression. These effects resemble those of mercury, but they are not the same. The excoriation from the nitro-muriatic acid never reaches deeper than the cuticle: it never gives rise to fœtid ulceration of any kind; nor does it produce the least offensive smell of the breath nor in the mouth. The effects of it in this way are surprisingly fugitive. At one hour the discharge of saliva may be excessive; the next it will stop, and perhaps suddenly come on again. The excoriations in the mouth generally go away in a day or two, if the remedy be discontinued, and appear no more. While the mouth in this way is affected by the acid, the teeth partake of uneasiness; but I never saw this in a considerable degree, nor have I known any injury done to the teeth or their sockets.

These last-mentioned effects are seldom met with to the extent that I have described, and need not be excited unless some peculiar circumstances require an unusual power, such as the symptoms of syphilis. I have lately added more and more

of the muriatic acid in proportion to the nitric, and the effects have proportionally increased. I now make use of equal parts of the acids. Would not the greatest power of the remedy be obtained by those proportions that produce the greatest quantity of chlorine; for from that element I believe all its effects arise? I am yet ignorant what effects would be produced by the muriatic acid alone.*

The nitro-muriatic acid appears in a particular manner to affect the glands, and to alter their secretions; and on this power a great part of its value in derangements of the liver seems to depend. It sometimes very suddenly increases the secretion of bile; and this effect may be kept up for a length of time. It increases the perspiration, and often to a great extent. Whether the nitro-muriatic acid be applied to the inner surface of the stomach, or to the external surface of the body, the effect is the same in kind, though not in degree. As a very general rule for its employment, it may be observed, that whenever the mercurial preparations are indicated the nitro-muriatic acid will be found useful, with this difference, that in cases where mercury is highly injurious from delicacy or peculiarity of constitution, or from other causes, the nitro-muriatic acid may be employed with safety and advantage. On the other hand, I should not at present recommend it in acute diseases, with the exception of some kinds of fever, and of hepatitis of every character. Where the pulse is quick, and where there is an inflammatory tendency, I think it would be injurious.

I was first led to the use of the nitro-muriatic acid from an attention to the diseases of the liver. The derangements of that organ, and of its secretion, open a vast field for inquiry, which has been but imperfectly explored. I shall, as an example of the application of the nitro-muriatic acid, say a few words on this important subject.

Acute and chronic Hepatitis.

With regard to acute hepatitis, if pure and unmixed, the propriety of employing the nitro-muriatic acid might admit of

* Since I wrote the above, some of my friends as well as myself have used, for sponging the skin, chlorine dissolved in water, and with the same effects exactly as arise from the union of the acids.

a doubt; but the same observation may be applied to mercury. I think, however, that I never met with a case of acute hepatitis, that did not partake of the chronic affection, either at its commencement or soon afterwards. I know from experience that within the tropics, where I lived so long, a proper use of mercury is never to be neglected in either affection of that organ. I have not trusted to the acid where I thought the risk of abscess considerable; but without delay have employed mercurials, and every other means in my power to prevent, if possible, a termination so lamentable. I should now not hesitate to add this new power to the other means; and have no doubt, if really insufficient of itself, it would greatly aid us in affording security and relief.

Chronic hepatitis is a far more common disease, than the acute; but it may be considered as always partaking of the nature of both. One portion of the same liver is often insensible, enlarged, and inactive, while another part of it is suffering from all the symptoms of acute hepatitis, and going on to the formation of pus. It is this mixed disease that we meet with so generally in India, as well as in this country; and it is this state of the liver which gives rise to so great a variety of anomalous symptoms.

For this chronic affection, it appears to me, that the nitro-muriatic acid applied to the skin, is the most effectual and the safest remedy. A few hours, or even a single hour, will sometimes bring relief; but it is necessary to continue the remedy till the system be sufficiently affected by it, and to repeat it occasionally *till the patient has recovered his usual degree of strength.* This is a rule in affections of the liver, of the utmost importance. A state of weakness, however produced, is the great remote cause of those chronic affections; so that we may remove the disease, but till the strength and vigour of the circulation be restored, we have no security against a return of it.

This affection of the liver produces a vast variety of diseases, to which various names have been assigned. To describe them well would require much time, and occupy many volumes. The process of digestion has an intimate connection with the bile; if this be depraved, the stomach and intestinal canal par-

take immediately of the disorder. The brain, which seems to be the source of feeling and motion, is connected by means of numerous nerves with those abdominal viscera, by which so many of the functions of life are carried on. A diseased state of the bile has a wonderful influence on the whole nervous system: it gives rise to pain and giddiness of the head: a great dislike to motion, and a sense of weakness, rather than actual weakness: cramps come on in the legs while asleep: the soles of the feet are tender and painful, and at times the sick rather drag them than raise them when they walk. A most able and intelligent friend, who was lately relieved very suddenly by the nitro-muriatic acid bath, from a state of long continued nervous irritation, is of opinion, that all the misery he had suffered for years arose from a depraved state of the biliary secretion. His observations on himself are curious and very important. He had long taken notice that the bile, though at times ample in quantity, was insoluble in water, and that the fæces had lost entirely the fæcal odour. The solubility in water, with this peculiar odour, gradually returned from the use of the remedy, while at the same time the irritable state of the nervous system was suddenly corrected. But I think there is sufficient evidence that this acid in some cases acts directly on the nervous system; for in some people I have seen it very suddenly produce a sense of composure, of quiet and of happiness, and for days together they have been sensible of a degree of an agreeable intoxication.

There are other symptoms, though less obscure, perhaps, in their origin, that are often connected with the chronic affection of the liver. The blood cannot pass through it with the facility necessary to health, nor is it possible to relieve it effectually from such a state, but by giving solubility to the bilious matter. It then passes off abundantly through the proper channels into the duodenum. If from obstruction or enlargement the blood be prevented from circulating with ease in the liver, a general disorder of the whole frame becomes apparent. The feet and ankles swell, and a fulness in the head comes on, with head-ache and giddiness, and a train of unhappy feelings. In this country it is a common practice to have recourse to the abstraction of blood by cupping, or by the lancet, in order to

alleviate such symptoms. The first effect of this practice is, no doubt, occasionally to give relief to the head; but this is only temporary. An equal quantity of blood is again accumulated; a repetition of blood-letting is required; the state of weakness continues to increase; and the patient falls a victim at last to an injurious practice, derived from a theory altogether erroneous. It is not by letting off a part of the blood, that we can do any good; for it is neither too abundant in quantity, nor bad in quality. The fulness of the head, as well as of the feet, does really arise from the remora to the blood in another portion of its circuit; and in both extremities of the body it is produced by one and the same cause.

I need hardly say that melancholy and despondency of mind are often connected with a peculiar state of the bile, for this has been observed in all ages. This state of mind I have often seen removed by a proper use of the nitro-muriatic bath; and people of both sexes have assured me that they think it had preserved them from the crime of suicide, to which, during the horrors of their feelings, they had an alarming tendency.

That state of bile already mentioned, in which it seems to be deficient in quantity, and probably at the same time unhealthy in its nature, is very common. Of all hepatic affections, I think this attended with the most pain and distress of the bowels. This disorder of the biliary system frequently gives rise to a flux, which I have known to go on for many months, and even for years. I have generally seen a deficiency of bile without a tendency to flux, and often even accompanied by a constipated state of the primæ viæ. Such a condition of the liver and bile does frequently give rise to most uneasy derangements of the stomach; a tendency to acidity or heartburn; little ulcerations over the surface of the mouth and œsophagus, and perhaps extending downwards through the whole track of the intestinal canal. This aphthous disease is very distressing and dangerous, though I have been very successful in curing it by the nitro-muriatic acid. I know of no other remedy for this affection of the stomach and intestines, as the common means of cure seem to me to be very far from sufficient.

I may say with truth, that in such a condition of the liver

and bile, all remedies that stimulate or excite the circulation are *injurious*. Among such I may reckon wine, spirits, bark, bitters, and steel. With such agents opium has been classed; but many of its effects are peculiar to itself, and a proper application of it in such complaints is often of the utmost importance and utility. In almost every state and stage of diseased liver, opium may be given to many with benefit. Even in acute hepatitis it answers a salutary purpose when combined with calomel, or with the quicksilver pill: for unlike what occurs in other inflammatory affections, it seems in those of the liver to be unattended by almost any ill effect. In chronic hepatitis, it alone is able to calm the irritability and unhappy feelings, and to allow time for the application of the means of cure. It seems, indeed, by its sedative power, to have a beneficial influence on the liver, and perhaps to do something more than produce a temporary calm. Opium, however, should never be given in chronic hepatitis, without great attention to its effect in diminishing the propulsive motions of the primæ viæ. I have been accustomed to give an opiate at bed-time, together with some laxative substance, such as the sulphate of magnesia, to correct its constipating effect.

It is proper to observe, that bilious people, and especially those who have been subject to intermittents, after finding the utmost relief from mercury, or the nitro-muriatic acid, and at the moment when we think they are advancing fast towards a perfect recovery, are apt, all at once, to say they are unwell; to lose their appetite, to become a little feverish, and to complain of their head. If these symptoms be neglected, the patient soon gets regular attacks of a quotidian fever, beginning with a cold fit, and followed by the ordinary stages of that disease. Such is the connection which a great flow of bile, however excited, appears to have with fever of the intermittent kind.*

* Although I have not seen this fever under a violent form, yet it is depressive and inconvenient. It is easily stopped by the Peruvian bark, taken daily in decoction, before the hour of the fit, and repeated at the same time for a few succeeding days. A common wine glass full of it, every two hours, and repeated for three or four times before the fever is expected, I have always found to be sufficient for curing it. With some people, I judge it prudent to give the bark decoction during the whole of the time they use the

Besides this fever, which is of the true intermittent kind, there is very generally a troublesome symptomatic fever, that plagues bilious people. It steals on imperceptibly, and, when once begun, gives rise, with little other inconvenience, to a state of most obstinate sleeplessness. This too may be obviated by an opiate, given before the hour of its accession; but it can be cured only by correcting the cause of it. Opiates with bilious people are very apt to occasion great itching of the skin, by delaying the passage of the bile through the bowels.

From a diseased state of the bile the memory is often affected, and a degree of stupidity, and even of idiocy comes on. From this cause too, the hair at times grows harsh and hard to the feeling, and I have seen it, like the skin, become soft and flexible from the use of the nitro-muriatic acid. In both cases I imagine that the effect arises from the long suppressed matter of perspiration being abundantly restored. To all these I may add another inconvenient complaint from a bilious state, a frequent desire to pass the urine. Whether this irritation arise from a diseased sensibility of the whole nervous system, or from a morbid alteration in the urinary fluid, I do not know.

In all biliary derangements the rule is never to be forgotten, and I repeat it again, that *there is no security against a relapse, till the health ana strength are fully restored; and that till then, some repetitions of the remedy are necessary.*

The good effects of the nitro-muriatic practice can never be appreciated, until it has been discontinued for several weeks or rather months. During the use of the bathing or sponging, the pulse is often very quick, and patients grow thinner, even when they feel better. At times, too, they often complain of more than usual uneasiness in the liver, or in the region of it; they often lose their flesh, and look very yellow. The remedy seems to alter and agitate that organ. The flow of bile, when once excited, goes on for a number of days; and not, with some people, without inconvenience. If it do not affect the bowels as a laxative, it is highly necessary at this time to employ some substance that has this power, such as the sulphate of

acid. It is often very useful to add a few drops of laudanum to each glassful of the bark decoction.

magnesia, senna or aloes. In time, however, it is commonly found that the health, the strength, and the colour of the skin are much improved.

It is no small advantage of this practice, that we can apply the power in as high a degree as the strongest can bear, or in quantities so minute, that the most sensitive and nervous being can hardly be injured by it. I have immersed many to the chin in this bath, and I have been afraid, in other cases, to wet more than a single hand with the acid. The length of time, too, that the acid remains in contact with the skin, may be infinitely varied. We have thus a power extremely divisible, and applicable to almost every degree of resistance or sensibility.

When the acid produces very considerable effects, it is right, after a few days, to stop its use for a week or two; as, if used long, it gives rise to unnecessary uneasiness from bilious discharges or bilious feelings. I have said that drinking the nitro-muriatic acid has the very same effects with its external use. When taken in this way, it should be very much diluted with water. Indeed it should taste but very slightly acid, and be drank in small portions at a time. I need hardly say, that it is very necessary to take care that, even in this weak state, it be not allowed to touch the teeth. The mouth should be immediately washed after swallowing it, and every precaution employed, that is used with the mineral acids, to prevent injury from its external action. This way of using the nitro-muriatic acid is often very convenient and salutary, and in many cases may deserve a preference to any other. I think it is particularly applicable to some states of indigestion, and when we wish to produce effects gradually and insensibly.

On what principle to account for the singular agency of this compound acid on the skin, I confess myself in great doubt, or rather *in total ignorance.* That its power depends on chlorine, an elementary substance according to Sir Humphry Davy, there cannot be a doubt. The almost instantaneous effects that it produces on some people, its operation on the stomach, which it stimulates occasionally to contraction, and its suddenly causing a flow of bile, are all unlike a remedy that is conveyed by the known channels of absorption. In my opinion, the taste and the sensation that it occasions in the

mouth, are exactly such as are produced by the galvanic fluid, and it would be presumptuous to affirm, that no agency of a similar kind has an influence in the effects of the nitro-muriatic acid. I can suppose that the effects of this remedy do not arise from the transfer of matter by any set of vessels; but that they are the consequence of peculiar motions, which it has the power of exciting in the solids, or the fluids of the body.

I need hardly, I hope, observe, that after the treatment which I have recommended for bilious people, as well as during the employment of the acids, a regular and rather abstemious system of diet should be adopted. I have always thought that food chiefly of a vegetable kind is the most salutary, and that great temperance in the use of wine, or other liquors containing alkohol, is absolutely necessary, if indeed they are to be allowed at all. I perfectly agree in every thing that Dr Fordyce has said, with regard to the causes of the prevalence of bilious complaints in London. The sedentary occupations of many of its inhabitants, their eating great quantities of animal food and of butter, their use of porter, their living in close and hot apartments, deprived of exercise in the open air, with the sudden changes of a variable climate, are all powerful and sufficient causes of derangement of the liver, the stomach, and the other organs connected so intimately with the state of the bile.

It cannot be supposed that the experience of an individual is sufficient to ascertain the effects of a remedy, that is so widely applicable to medical practice as the nitro-muriatic acid. I have said that it is a substitute for mercury. In general its effects are equal to those of the mercurial oxides in the removal of disease, and in some cases I know that it possesses superior powers to any of them. I cannot give a better notion of the extent of its application in medicine, than by comparing its salutary effects to those of mercury, while with common knowledge and discretion it can do but little harm. If used with the mercurial preparations, it seems to quicken their effect and increase their power.

From the commencement of my search for a substitute for the oxides of mercury, I congratulated myself on knowing the composition of the nitric acid, and I have had reason, in

like manner, to be pleased with a similar knowledge of the substances still more compounded that I have employed with a like intention, and not without success. Although at present I have confined myself to some observations on a few of the derangements of the liver, and diseases of the bile, it must not be supposed, that during so long a period, I have not ascertained its effects in many more of the maladies to which we are subject. Some account of this experience was long ago published both in India and in England.

Russel Square, April, 1817.

P. S. Since I wrote the preceding paper, several of my friends have become convinced with me, that the very same effects arise from a diluted solution of chlorine in water, as are produced by the nitro-muriatic acid. Our late experience puts an end to all doubt, if any could have existed, that chlorine alone is the source of the material effects. We have sponged the skin with a solution of chlorine in water, and in many cases, have obtained the same results as arise from a similar application of the nitro-muriatic acid. The solution of chlorine to which I allude, is water through which the *oxi-muriatic acid gas* has been made to pass, until it could retain no more of it. This mode of applying chlorine has the advantage of not irritating the most sensible skins so much as the diluted nitro-muriatic acid might do; but even this solution I have diluted with about four times its bulk of water, before I applied it.

It is remarkable that the aqueous solution of chlorine, procured by mixing the acids together, is far less offensive than its solution got by the common means of passing the gas through water. Some degree of affinity seems in the first case still to subsist between it and the other elements of the acids, by which its sensible qualities are diminished to a certain extent. We are under great obligation to Sir Humphry Davy, for the light he has lately thrown on this subject, by which the effects of the *aqua regia* of the chemists are clearly accounted for.

I have of late received from different quarters, and from competent judges, a confirmation of the opinions I had ex-

pressed of the effects of chlorine in derangements of the liver, and in syphilitic affections. As those opinions were derived from experience alone, I cannot but think that a future day will confirm them.

I am told that some others have been less successful than myself or my friends with this remedy, and that by the application of chlorine to the skin, they have been unable to produce a sensible effect of any kind. I can make no reply to such opinions, as I do not know how the trials on which they rest have been conducted; but I must affirm, that I have sooner or later been able to produce very distinct effects in almost every case in which I have employed it. Time will decide between us; but on one side of the question I need not say, there is a want of right observation.

If it be considered that the most active of all the mercurial preparations in use are calomel, (submuriate of mercury,) and corrosive sublimate, (oxymuriate of mercury,) we may ascribe this great activity to the chlorine of the composition. Why the sanative powers of the mercurial preparations were supposed to arise from the metal alone, I cannot conceive. In like manner the chemists for a long time neglected the water that might be mixed with the materials of their experiments, the elements of which water gave rise to effects that misled them in all their reasonings. I am now nearly, I think, in a condition to show what effects in the system arise from mercury as a metal, and what effects are derived from the other elements of the mercurial preparations, whether this metal in them be combined with oxygen or with chlorine.

June 3, 1817.

Experiments on Croton Tiglium, or Purging Croton Nut. Extracted from a Letter from WILLIAM INGLEDOW, Esq. Surgeon, H. E. I. C. at Mysore, to MR. RUMSEY, Surgeon, Amersham.

[From the Edinburgh Medical and Surgical Journal, for April 1817.]

THE Croton or Jemahlgotta, is the most common purgative that is employed by the native physicians in the Deekan;

but, owing to the inaccuracy of their weights, they are liable to administer it in very unequal quantities; and from over doses being frequently given to their patients, the severe drastic effects of the croton have been experienced to a degree that have endangered life, which circumstances chiefly have brought the medicine into disrepute, and have occasioned it to be considered of a highly dangerous nature.

In the native books of physic, the croton is ordered to be prepared by boiling in cow dung and water, after the central film, which unites the halves of the nut, has been removed.

The thin film inclosed within this seed is said to be of a very poisonous nature; the operation of boiling renders the medicine milder in its effects, by extracting part of the oil which it contains; and to prevent vomiting, griping, and excessive purging, pepper, ginger, and borax, are usually combined with it.

Seeing a satisfactory account of croton as a purgative in Dr. Ainslie's Materia Medica, and having a good opportunity of employing that medicine in the Charity Fever Hospital of this place, I began to use it early in the year 1815. I preferred to commence with the native mode of preparing it to any other, until I might obtain some correct knowledge of its effects from personal experience; and it was accordingly administered, as above prepared, to twenty-six persons, giving to each adult, male or female, one grain made into two pills, with a few grains of powdered ginger. Upon nine of these the purging commenced one hour after the pills were taken. Upon six others, two hours afterwards; upon six, three do. do., upon two, four do. do.; upon two, six do. do.; and upon one it had no effect whatever. One person was purged twice; nine do. do. four times; four do. do. five do.; two do. do. six do. One of these individuals was griped severely; and ten others had a little griping.

Having derived a little confidence from the above trials, I prescribed the croton to nearly the same number of sick, after preparing it by extracting the film and boiling the nut in plain water merely; and its effects were similar to those of the former preparation.

I now determined to make trial of the croton after having

been exposed to the sun only; the film was removed, and the seed bruised and exposed for three days, by which means much of an oily substance was extracted.

This medicine was given to two hundred and forty-one persons, in doses of one grain to each adult, joined with a few grains of camphor, and made into two pills. Upon seven individuals it had no purgative, nor any sensible effect. Upon fifty-three others, purging commenced one hour after the pills were taken. Upon ninety-five, two hours afterwards. Upon thirty-six, three do. do. Upon thirty-five, four do. do. Upon six, five do. do. Upon six, six do. do. Upon two, seven do. do. Upon one, eight do. do. Nine of these were purged once; thirty-two, twice; thirty-seven, thrice; fifty-seven, four times; forty, five do.; twenty-two, six do.; six, seven do.; eleven, eight do.; five, nine do.; eight, ten do. Five others were purged eleven, twelve, thirteen, fourteen, and twenty times, and two had each fifteen purgative evacuations.

Of the above individuals sixty-five were vomited from one to four times; one of them had six and another eight vomitings from the pills.

Thirty-seven were griped in a trifling degree; forty others experienced more griping pain, and some of these latter were severely griped. A few had both vomitings and gripings, of these two last descriptions of sufferers.

In the above list ten were boys and girls, seven and eight years old; they took the croton in smaller doses, proportioned to their ages.

Being satisfied that the croton was an excellent purgative, and could be used with perfect safety, I wished to ascertain the powers of the expressed oil. I procured a small quantity that had been some time prepared; but as it was old, its operation was very uncertain, and it frequently had no sensible effect whatever.

After obtaining a supply of newly expressed oil, I prescribed it to thirty-four adults, in doses of five drops to each; and understanding that the oil of croton was more violent in its operation than the prepared nut, I declined administering it to any but full grown persons. Ten of these patients were purged in one hour after taking the oil; eleven others in two hours after-

wards; seven in three do. do.; six in four do. do.; two were purged twice; four do. three times; seven do. four do.; three do. five do.; seven do. six do.; one do. seven do.; four do. eight do. Three were purged nine, ten, and eleven times; one eighteen, and two twenty times.

Of those who took the oil of croton, thirteen had from one to four vomitings; six experienced a little, and twelve much griping. A few of this number had both vomiting and griping.

The oil was laid aside, as its effects were complained of; and the vomiting and griping it occasioned were both more frequent and more severe than when the pills were used.

The trials of the croton, from which these remarks have been taken, were made prior to the month of February last, since which period the same preparation of that purgative has been administered to two hundred and twenty-seven persons more; but as the effects were very similar to those above detailed, they were not particularly noticed in the relations of the cases.

In June, July, and August last, I have prescribed the croton to one hundred and sixty-four other patients, but instead of having it contused, the seeds, having the films taken out, were exposed entire to the sun until they became hard, and so dry as to admit of being divided into minute particles by trituration. This process requires a little attention to secure the proper quantity in every dose, and the oil which the croton contains prevents its being reduced to an impalpable powder.

The croton for this preparation was exposed during three days; the doses were the same in quantity as were previously used, and the effects similar, except that the number of purgative evacuations was frequently greater, owing to a larger proportion of oil being retained in the nut by exposing it whole to the sun.

Having prescribed the croton to upwards of seven hundred persons, I can pronounce it to be a valuable and safe purgative. I have not ventured to give it either to children under seven years of age, or to any individual much advanced in life. The above trials have been made almost entirely upon sick poor from this town and neighbouring villages, and sepoys

and others in the service of the Rajah, who sought relief at the Fever Hospital. Some of the former were ill provided with the common necessaries of life; and upon such subjects the effects of the croton might be expected to be more severe than with the other natives liberally supplied with good food, or upon Europeans, who possess naturally much stronger constitutions. A few of these patients were Company's sepoys.

Croton purges should be employed with caution to persons debilitated by mercury, or infirm from long-continued sickness, as their operation is sometimes extremely severe upon such patients, and occasions them considerable distress.

Whenever this medicine purges too violently, the native practitioners employ ghee, or butter, internally, along with congee, or rice water, or, instead of these, cold buttermilk, to check its operation; and sometimes they use affusions of cold water upon the body for this purpose. I have tried the former in a few instances, and was told with good effects.

Mysore, September 10, 1816.

History of a case of Ill Conditioned Ulcer of the Tongue, successfully treated by Arsenic. Communicated in a letter from Charles Lane, Esq. to Henry Cline, Esq. President of the Society.

[From the Medico-Chirurgical Transactions, Vol. VIII. Part I.]

Arundel, Dec. 16, 1816.

My Dear Sir,

You possibly may call to your recollection a case of ill conditioned ulcer of the tongue, in a gentleman whom I brought to you for your opinion in the year 1813; you deemed it at the time a very alarming case, and said that only two so formidable of the kind, had ever before fallen under your observation. The fortunate result of this case, and the very great and decided benefit derived from the use of arsenic in it, induced me to trouble you with the following account of its history.

Mr. G. B. aged 23, came to me in the month of June, 1813, with a very foul ulcer beneath the tongue; and said that he some time before had one on the upper part of it, which he said was healed; but on examination, there was a deep, irregular fissure, with raised, jagged, hardened edges, communicating with the ulcer under the tongue; which on examining with a probe, I found not only communicated with the fissure on the upper surface, but the instrument passed through the substance of the tongue, into a deep-seated ulcer at the root of it, and thence into the throat. The general appearance of the disease was most alarming, bearing a very strong character of carcinoma. A variety of means had been resorted to, without procuring the least alleviation of his sufferings, or producing any alteration in the state of the ulcer; he experienced great pain and difficulty in deglutition, and complained that the pain had of late extended behind the ears, to the back of the head and neck: mercury had been administered, but with evident bad effect; and the disease not only resisted every effort made to arrest its progress, but its baneful influence appeared to be extending itself to all the adjacent parts. The general health of the patient had sunk considerably; his pulse was small and tremulous; and he complained of excessive fatigue from the slightest exertion; his hand felt cold and clammy, and there existed a total want of energy in his whole system.

Under these circumstances I thought it a case in which arsenic might be administered with advantage; and I gave him ten minims of the solution every eight hours, gradually increasing the dose until he had experienced some sensible effect from it; and seventeen minims was the largest dose his stomach would at any time bear—the ulcer was injected twice a day, with a lotion containing a small portion of the solution in it, and I desired him to live on a light vegetable and farinaceous diet, with milk, and to abstain from wine, spirits, and fermented liquors; his bowels were regulated by means of small doses of magnes. sulphas.

The ulcer in about ten days put on a more favourable aspect, and at the end of a month it appeared perfectly healed.

Mr. B.'s health being now greatly amended, he indulged himself in taking very strong exercise; nor did he any longer restrict himself in his mode of living; and at the termination of some weeks the ulcer again made its appearance, and again yielded in about three weeks to the same mode of treatment. Not deterred by what had before occurred to him, he again became intemperate in his use of exercise, and careless in his manner of living; and at the latter end of the month of September, the disease returned with all its train of horrid symptoms, very greatly aggravated: at this time business calling me to town, I requested him to take the opportunity of consulting you; but before we commenced our journey I emptied his bowels well with magnes. sulphas, and once again desired him to have recourse to the solut. arsenici; and although he had taken it but four days, when I had the pleasure of seeing you, which was on the 1st of October, 1813, the ulcers had evidently assumed a much better appearance; and you desired him to continue the solution, taking at the same time, a drachm of pulv. sarsaparillæ twice a day: you likewise enjoined a most strict attention to that kind of diet which I ordered in the first instance; and impressed on his mind, the absolute necessity of persisting in it, for a very considerable time after the ulcers should again heal. He took the solution in doses of seventeen minims every eight hours for three weeks; the ulcers again healed, and he continued taking the solution for ten days after they were well. He complained at this time of great languor and debility; his pulse was small, feeble, and very quick; I prescribed for him two ounces of the mist. ferri comp. to be taken twice a day, which he continued taking for a considerable time with the most decided good effect; and I am happy to report, that this most alarming disease had at last yielded to the treatment he had now steadily pursued, and he has continued to enjoy an uninterrupted state of good health unto the present time.

I delayed troubling you with this statement, that I might have an opportunity of ascertaining the permanency of the cure; as more than three years have elapsed since the ulcers

had healed, I think I may safely calculate on the disease being perfectly subdued.

With every sentiment of esteem and respect, allow me, dear Sir, to subscribe myself,

Your most obliged and faithful,

CHARLES LANE.

To HENRY CLINE, Esq.

On a new Mode of exhibiting Mercury; with Remarks upon Amputation at the Shoulder Joint. By JOHN GOOCH, Esq. Surgeon, R. N.

[From the Annals of Medicine and Surgery, for March 1817.]

EVERY surgeon is aware of the accidental manner in which Mr. Crowther salivated his patient, by dressing a blistered surface with an ointment, containing the corrosive sublimate; still no attempts have been made to try the effect of impregnating the system in this way, probably from the severe pain and inflammation produced by it in Mr. Crowther's patient; for, I must confess, this often deterred me, when in actual service, from making trial of the practice, in preference to that disgusting but efficacious mode, of inducing salivation by inunction. Accident has, however, discovered to me a mode of impregnating the system by the sublimate, with but a very trifling degree of pain to the patient. A few days since I was consulted by a most intimate friend, on the subject of a little boy, eight years of age, who had caught the itch, from sleeping with the servant; and as it was particularly wished to avoid the use of sulphur, I directed the whole surface of the body to be sponged nightly with a strong solution of corrosive sublimate dissolved in common gin: this, after the third application, caused considerable irritation *on the surface;* and raised some small vesications on the abdomen, where the eruption had been more full; these were suffered to break, and in twelve hours, without any application, they were quite sunk and dry without pain or irritation, and the boy's system was strongly impregnated by the medicine, the breath being highly fetid,

and the fauces somewhat swelled and sore. Although Mr. Pearson does not speak favourably of the sublimate in the cure of primary syphilis, yet he acknowledges it to be peculiarly "efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions;" and if so, what a great advantage it must be, to be enabled to apply this virulent medicine with better effect to the surface, than to the delicate coats of the stomach, where, from its nauseous qualities, few are able to retain it, except after a full meal. This practice, of sponging the surface with a solution of the sublimate, appears to me to be particularly applicable to cases of venereal eruptions, and worthy of trial in all cases, as a cleanly and far preferable application to the black and greasy unguent; and I would recommend to my naval brethren, whose practice is more absolute, to make full trial of it, and report the result. The principal object in the use of the ointment is to impregnate the system without impairing it, by not affecting the bowels, as the internal prescriptions will do in spite of all the opium we can use. After the system has become affected by the use of the solution, the mercurial action may, I imagine, be sufficiently supported by the use of the pil. hydrarg. should the irritation on the surface be so great as to forbid its further application. Should such a mode of producing mercurial action in the system be found to answer, how gladly would it be embraced by persons in all ranks of life, as simple and cleanly; and we should not find those insuperable objections we now meet with, when recommending the use of the unguent in preference to the pill.

JOHN GOOCH,
Surgeon, R. N.

17*th Jan.* 1817.

P. S. I do not mean to deny that the mode of fumigating the system, as recommended by Abernethy and Silonette, is not far preferable to this, where it is convenient to apply it; but this happens in few cases, except those under hospital treatment, where the surgeon no sooner forms his determination than he has the power to put it into execution.

Now that I am trespassing upon your columns, I shall take the liberty of offering a few observations on that "*dreadful*

operation," as it is called, of amputating the arm at the shoulder joint, and which has lately been touched upon by Mr. Charles Bell, in his collection of surgical cases. That gentleman appears to doubt the possibility of entirely commanding the flow of blood by the compression of the subclavian artery, and recommends, after dividing the capsule to introduce the thumb of the left hand into the joint, "betwixt the glenoid cavity and the head of the humerus," and bending the fingers of the same hand into the axilla, to compress the artery between them and the thumb, whilst performing the semicircular incision which separates the arm from the body, and of course divides the artery. This has a very specious appearance; but might not many practitioners, operating in this manner, leave too much integument to form a handsome stump; as, in my opinion, the beauty of an amputation at the shoulder depends on the flap formed by the deltoid being *rather small*, and the integuments beneath not left too long, so as to require some little adhesive power to bring the edges of the wound together. As to the power of commanding the blood by pressure above the clavicle, there can, I think, be but one opinion, viz. that it is at all times possible, by the thumb of an assistant, or an instrument adapted to the parts; and perhaps the best that can be used is a boot-hook, lightly padded. With regard to calling the operation bloody, or dreadful, it is in my humble opinion ridiculous, as I conceive it may at all times be performed with greater facility, and with as little pain to the patient, as a common amputation: I do not wish it to be understood by this, that I am an advocate for the performance of this or any other operation, unless absolutely necessary, but to do away the idea of frightening the young surgeon, by making him believe the "mole-hill to be a mountain."

History of a case of Lithotomy, with a few remarks on the best mode of making the Incision in the Lateral Operation. By Samuel Cooper, Esq. surgeon to the forces.

[From the Medico-Chirurgical Transactions, Volume VIII. Part. I.]

Of all the great operations in surgery, lithotomy is perhaps that, in which great aukwardness, mortifying failures, and

dangerous blunders, are most frequently observed. Many a surgeon, who contrives to cut off limbs, extirpate large tumors, and even tie aneurismal arteries, with *éclat*, cannot get through the business of taking a stone out of the bladder, in a decent, much less a masterly style. This fact is so familiarly known in the profession, and its truth so often exemplified, that I may well be excused the unpleasant task of relating, in proof of it, all the disasters, which have come to my own personal knowledge. But I must take the liberty of remarking, that, in this branch of surgery, a great number of individuals do not profit by these instructive lessons of experience. It is true, the more they see of lithotomy, the more they are convinced of its dangers; yet, too often, instead of studying the causes of ill success, they merely derive, from the examples before them, a suspicion of the unskilfulness of the operator, or some discouraging conjectures about the difficulties of the operation.

The establishment of certain principles, to be observed in lithotomy, appears the most probable way of diminishing the frequency of the accidents and failures of this common operation. If these principles are not violated, the kind of treatment employed is but a secondary consideration, and the surgeon may do nearly the same thing with an ordinary dissecting knife, a concealed bistoury, a beaked scalpel, or a well-made gorget.

In the present paper, I propose to recite a case of lithotomy, which was attended with some particularity, and then offer a few general observations on the proper direction and size of the incision. These points are far from being settled, as must be plain to every body, who recollects, that Mr. John Bell recommends a free opening; Scarpa, a small one; that Mr. Abernethy and Scarpa prefer gorgets, which cut upwards and outwards, either at an angle at 45° or 69° from the axis of the urethra; and lastly, that the gorgets of Desault, Mr. Cline, and most other surgeons, are constructed for cutting, either directly outwards, or outwards and downwards.

When I was in charge of the military hospital at Oudenbosch, in Holland, in the spring of 1814, Sergeant Ryan, of the 1st Foreign Veteran Battalion, desired me to see his little

boy, about four years old, whose complaints made me immediately suspect a stone in the bladder. As I had no sound, I introduced a small silver catheter, with which a calculus was distinctly felt. Without taking the instrument out of the urethra again, I determined to perform lithotomy with a common dissecting knife. Indeed, no other mode could be adopted, as we had neither a staff, a gorget, large forceps, nor lithotomy instruments of any kind. After making the external incision in the usual way, and dividing the membranous part of the urethra, I dissected along the side of the catheter, until the prostate gland, and a small portion of the bladder beyond it, could be plainly felt with the fore-finger of my left hand. In this step of the operation, the edge of the knife was constantly directed inwards and upwards. The catheter was then withdrawn, as its very small size and round shape without any groove, made it impossible for me to derive any further assistance from it. The prostate gland now served as my guide in the completion of the internal part of the incision. With the edge of the knife, therefore, directed inwards and upwards, I cut into the bladder behind the base of the prostate gland; and carrying the incision forwards, under the direction of my left fore-finger, I made the requisite division of the neck of the bladder, and upper part of the side of that gland. With a small pair of ordinary dressing forceps, a roundish stone about an inch and a quarter in diameter was readily extracted.

This operation was done at the hospital, in the presence of Dr. Shanks, of the 56th regiment, and several other medical officers. No unfortunate symptoms followed, notwithstanding the child was put into a baggage cart two days afterwards, and conveyed in this manner in the rear of the regiment, a march of two or three days. Such premature disturbance, however, and the totally neglected state of the little patient, for nearly ten days, made the wound longer in healing than usual.

The preceding case is related, not with any view of persuading future operators to adopt exactly the plan, which the want of a staff obliged me to follow; for, if this instrument had been at hand, I certainly should not have withdrawn it before the completion of the internal incision; but, having turned its

convexity outwards and downwards, I would have cut inwards and upwards, into its groove. Thus, I conceive, the neck of the bladder and side of the prostate gland, might have been divided with greater convenience and safety.

My principal design is to bring to the recollection of surgeons the several advantages of making the incision through the whole of the parts cut in lithotomy, in a straight, regular, direct manner, from the surface of the skin in the perineum, to the termination of the wound in the urethra and bladder. In an adult subject, the external wound should commence about an inch above the anus. The impropriety of beginning it higher up has been duly insisted upon by Sharp, Bertrandi*, Callisen†, and every good writer on the operation; yet, extraordinary as it may seem, this is one of the most common faults still committed by modern surgeons. The incision in the integuments is to be ample, that is to say, at least between three and four inches in length; because a free opening in the skin is not only exempt from danger, but attended with considerable advantages, especially those of facilitating the other steps of the operation, and preventing afterwards any lodgment and effusion of urine. The external wound ought to be directed towards a point situated a very little towards the anus, from the innermost projection of the tuberosity of the ischium. From the line thus made, the incision should be carried inwards and upwards, through all the parts between it and the side of the prostate gland. Another line, extending from the inferior angle of the wound, to the termination of the cut in the bladder, forms the precise limits, to which the depth of the incisions should reach, and no further.

The great principle of making the axis of the wound as straight and direct as possible should always be kept in view,

* "Il ne faut couper l'urétre que le moins qu'on peut, parcequ'on obtient par ce moyen une meilleure voie pour pénétrer dans la vessie sous l'angle du pubis. C'est avec raison que Sharp dit que l'incision de l'urétre faite au dessus de cet angle est si peu utile pour l'extraction de la pierre, qu'on n'en retireroit pas plus d'avantage en le coupant presque dans toute sa longueur." Traité des Opérations, p. 127.

† "Ut eæ partes haud sectione attingantur, quæ pro calculi egressu nihil faciunt; adeoque bulbus urethræ et hujus pars corpore spongioso circumdata intacta relinquatur." Systema Chirurgiæ Hodiernæ; pars posterior, p. 665.

whether the surgeon employ a common scalpel, which cuts into the bladder from without inwards, or other instruments, which divide the prostate gland and neck of the bladder, from within outwards, like the *bistouri caché*, beaked knives, and every kind of cutting gorget. In the latter circumstance, the only difference consists in cutting, from the bladder and urethra, downwards and outwards, towards a point, situated a little way from the tuberosity of the ischium, towards the anus, instead of carrying the incision from this point, upwards and inwards, through the upper part of the side of the prostate gland, and orifice of the bladder.

The following may be enumerated as important advantages from attending to the foregoing principle.

1. The wound is made in a direction which affords the greatest room for the extraction of large stones; and the axis of the incision being also as nearly straight as possible, the introduction of the forceps, and the passage of the calculus outwards, are materially facilitated.

That these are important advantages, I think every surgeon will allow, who knows how much of the pain and danger of lithotomy depends upon the injury, which the parts suffer from the violence used in drawing out the stone,* and the repeated introduction of the forceps. Larger stones may likewise be thus extracted, than in any other way of making the lateral incision, as must be obvious to every practitioner, who reflects for a moment upon the very limited room afforded at the upper part of the triangular space, between the arch of the

* Cheselden, the most successful lithotomist England ever produced, made the incision in the direction here recommended,—sometimes inwards and upwards; sometimes outwards and downwards. The following remarks of another distinguished surgeon merit particular attention. "J'ai vu plusieurs fois dans les Hôpitaux de Paris, que les chirurgiens, coupant trop en haut vers l'angle du pubis sentoient une grande résistance au périnée, quand ils vouloient retirer le calcul avec les tenettes; on voyoit le périné se tuméfier par la pression, qu'y faisoit la pierre; en ce cas, quelques opérateurs plus sages abandonnoient la pierre, introduisoient de nouveau le gorgeret, et en tournant en dessous la cannelure de celui-ci, prolongeoient l'incision obliquement vers la tuberosité de l'os ischion; et enfin à la faveur de cette plus grande ouverture, retiroient la pierre sans cause de déchiremens." Bertrandi, Traité des Opérations, p. 133.

pubis, the ramus of the ischium, and the neck of the bladder. This consideration cannot fail to have great weight with all surgeons, who feel duly convinced, how unsatisfactory a method it is to break a calculus, in order to get it out of the bladder. The measures necessary for the removal of all the fragments protract the completion of the operation, and seriously increase its danger; while the continuance of a single fragment of the stone behind, may cause a renewal of all the grievances, for the cure of which, the patient submitted to the operation.

2. The arteria pudica profunda can never be injured, because the surgeon does not let the knife, or other instrument made use of, cut in a direction which would bring it into contact with the inside of the tuberosity, or ramus of the ischium, where that vessel is situated.

3. The rectum will not be wounded, because the direction of the incision, either downwards and outwards, to a point situated a little way from the tuberosity of the ischium towards the anus, or from that point inwards and upwards, sufficiently removes the knife from the intestine. But no surgeon should be unmindful, that, when the rectum is considerably distended with fæces, it rises up a little way by the side of the prostate gland. Hence, the prudence of emptying the large intestines, by means of a clyster, a short time before the operation. In using the knife, however, the surgeon always has it in his power to press the rectum downwards with the fore-finger of his left hand, when he is about to divide the prostate gland.

4. As the seminal duct penetrates the lower part of the substance of the prostate gland, in order to reach the urethra, and the knife, or other instrument employed, divides the upper portion of the side of that gland inwards and upwards, or outwards and downwards, it is obvious, that the duct will not be in any danger.

The judicious Callisen is well aware of the advantages of making a regular, direct incision into the bladder;* but, like

* Vulnus sit æquale, haud angulatum, conicæ figuræ, apice vesicam respiciente, externa plaga ampla, et quatuor pollicum longitudine; unde

Professor Scarpa, he is averse to making a free cut through the neck of that viscus. Indeed, as we shall presently notice, Scarpa does not sanction cutting any portion of the bladder whatsoever.

Every practitioner who will take the trouble to look over the history of the lateral operation, will find, that such lithotomists as have particularly distinguished themselves by their unparalleled success, as Frère Jacques, Cheselden, Côsme, &c. all made a free incision into the bladder. This fact alone is enough to raise doubts of the goodness of the advice delivered upon this subject by Callisen and Scarpa; especially, as neither they, nor any other modern surgeon, can boast of having cut patients for the stone, with a degree of success at all equal to that of the above-mentioned operators. Of fifty-two patients, whom Cheselden cut successively, he lost only two; and out of two hundred and thirteen of all ages, constitutions, &c. only twenty. The accounts which we have of the successful operations done by Frère Jacques and Côsme, are equally remarkable. During my residence at Paris, last spring, I saw a celebrated lithotomist of that city, an actual descendant of Frère Côsme, extract a stone of considerable size, on the plan of his well-known ancestor. The incision was ample and direct, so that the calculus was taken out with perfect ease. Now, as the operations of this professed lithotomist are very numerous, and he enjoys the reputation of scarcely ever losing a patient, we are bound to conclude, that his plan of making a free opening, and directing the incision downwards and outwards, is well deserving of general imitation. At the same time, we are also justified in inferring, that the advocates for a small incision are promulgating the worst advice, which can be offered to the lithotomist. My own observations decidedly tend to these conclusions, as will be presently explained.

The Tract* recently published by Scarpa, has for its main objects the recommendation of a modification of Hawkins's

effluxus sanguinis, puris, lotii, arenæ facilitatur. Syst. Chir. Hodiernæ; Pars Posterior; p. 656.

* Memoir on the cutting gorget of Hawkins, &c. translated by Briggs.

gorget, and the inculcation of the propriety of making a small limited incision in the prostate gland, without cutting any part of the bladder. As sufficient room cannot thus be obtained for the extraction of even a stone of moderate size, he is an advocate for the gradual dilatation of the urethra and orifice of the bladder. He maintains, that the lateral operation, though executed with the greatest precision, does not exempt the surgeon from dilating, in a certain degree, the orifice of the bladder and cervix of the urethra; the dilatation of those parts, however moderate, being always necessary, even where the calculus is of middling size. He states, that, in an adult, the orifice of the bladder dilates almost spontaneously to the diameter of five lines; and he adds, that the lateral incision, within proper limits, divides the body and base of the prostate gland to the depth of four, or at most five lines, forming with the five, to which the orifice of the bladder naturally yields, an aperture of ten lines. But, observes Scarpa, in an adult, a stone of ordinary size and oval figure, is sixteen lines in the small diameter, to which must be added the thickness of the blades of the forceps: consequently, even after the incision has been made with the most scrupulous exactness, the stone, though of moderate size, cannot pass out of the bladder, unless the dilatation of the base of the gland and orifice of the bladder be carried to the extent of nearly eight lines, beyond the size of the aperture made with the knife. But, says Scarpa, if, in order to avoid distending the parts to the extent of eight lines, the base of the prostate gland, together with the orifice of the bladder and a part of its fundus, be divided to a depth equivalent to it, *the event would necessarily be an effusion of urine into the cellular membrane, between the rectum and bladder, and consequently suppuration, gangrene, fistulæ, and other serious evils.* (pages 4 and 5.)

According to Scarpa, the apex of the prostate gland forms the greatest resistance to the introduction of the forceps, and the extraction of the stone, and therefore ought to be completely divided (p. 7.); but, he contends, that two, and sometimes three lines of the substance of the base of the gland, should be left undivided; which, he asserts, is a matter of great importance, because the untouched portion, around the

orifice of the bladder, prevents the effusion of urine, and the formation of gangrene, or fistulæ, between that viscus and the rectum. (page 22.)

After this statement of Scarpa's sentiments, respecting one of the most interesting points of the lateral operation, a question or two naturally arise. Are we then to conclude, that the plan of making a free and direct incision into the bladder, ought to be abandoned? Must we forget, that it was this method which answered so well in the hands of the several renowned lithotomists already enumerated? And must we believe, that the advice delivered upon this subject by Bertradi, Desault, Mr. John Bell, and all the best modern surgeons in this country, is founded only upon a capricious partiality to the free use of cutting instruments? Earnestly as I respect the names of men, who have signalized themselves so much as Callisen and Scarpa, their authority can only influence me, inasmuch as I find it coincide with the dictates of experience, the great arbitrator of every disputed point in practice.

We have seen, that an apprehension of effusion of urine, gangrene, fistulæ, &c. is the only reason assigned by Scarpa for his aversion to making a complete division of the side of the prostate gland, and orifice of the bladder. But, I would inquire, do we find extravasation of the urine, between the rectum and bladder, and gangrene and fistulæ, so frequent after lithotomy in England, as to render it probable, that these ill consequences can ever proceed from our usual mode of dividing completely not only the side of the prostate gland, but also the adjoining part of the bladder? Are those bad effects so often experienced in this country, as to constitute a material source of uneasiness in the mind of a surgeon about to undertake lithotomy? Do they form a substantial reason for abandoning the maxim of always endeavouring, as far as circumstances will allow, to make an incision of sufficient size for the easy removal of the calculus? And would not Scarpa's method of stretching and dilating the wound, in order to get the stone out of the bladder, often dangerously prolong the operation; lead to much mischief from the repeated use of the forceps; cause serious contusion and lacera-

tion of the parts; and, for all these reasons, increase the chance of inflammation of the bladder and peritoneum? It is this inflammation which destroys more than nine-tenths of the patients, who perish after lithotomy; and it appears to me, that the apprehension of it, from the consequences of making a small opening, is much better founded, than the fear of fistulæ, &c. from practising a large one.

In the course of the nineteen years that I have been in the profession of surgery, I have seen the lateral operation performed more than fifty times, either with various kinds of gorgets, beaked knives, the *lithotome caché*, or common scalpels. In all these examples, the avowed intention of the surgeon was to make a free opening into the bladder. I do not mean to say, however, that this was always actually effected, since the bad construction of some of the instruments employed, and other causes, sometimes frustrated the wise design of the operator. But what was the consequence? Generally speaking, those surgeons who made only a small incision into the bladder, and kept their patients a long while upon the operating table, before they succeeded in getting out the stone, by the repeated and violent use of the forceps, had the mortification to see very few of their patients recover, a large proportion being carried off by peritonitis, on the third or fourth day after the operation.

On the contrary, when the incision was ample and direct, so that the calculus could be easily and gently removed, the patients were almost invariably saved.

It merits particular notice, that, of late years, gorgets have been less employed than formerly, in one of the principal hospitals* of this metropolis, scalpels and beaked knives having been preferred; andthat since this beneficial change in practice, fewer patients have been lost there by peritonitis. This fact serves as a material confirmation of all that I have urged in the foregoing pages; because, the common fault of gorgets, particularly of those used some years ago, was to make too small an opening, and this sometimes not in the best direction. But, when a common scalpel, or beaked knife was preferred,

* Saint Bartholomew's.

the surgeon generally made the incision in the prostate gland and neck of the bladder, large enough for the easy passage of the stone, and always downwards and outwards in the most advantageous direction.

With respect to the degree of importance which ought to be attached to the fear of effusion of urine between the bladder and rectum, gangrene, fistulæ, &c. I can only repeat, that they are inconveniences which are not commonly observed after lithotomy in this country. In two or three instances only, I have known the urine come through the wound longer than usual; but even these cases ended well. As for the extravasation of urine and sloughing, although there cannot be a doubt of their occasional occurrence, they cannot be fairly imputed to the method of operating in England, since they have not taken place after any of the numerous operations, with the results of which I have been acquainted.

All these facts and considerations, therefore, incline me to doubt, whether the apprehension of effusion of urine, fistulæ, &c. be sufficiently serious and well founded to render it adviseable for surgeons to relinquish the plan of making a complete division of the side of the prostate gland, and part of the bladder in the operation of lithotomy. Nor is it at all clear to my mind, that effusion of urine and sloughing are likely to be the effect of practising a free opening. Indeed, when they do happen, I suspect that they generally proceed from a totally different cause, *viz.* from the incision in the skin being too small and too high up, and from the axis of the internal part of the incision not corresponding with that of the external wound. Hence, the urine does not readily find its way outward, and some of it passes into the neighbouring cellular membrane*.

* In noticing the faults of Hawkins's gorget, Desault has observed: "La methode de l'enfoncer horizontalement dans la vessie sur le cathéter tenu à angle droit avec le corps, a deux grands désavantages: d'un côté celui de pénétrer par l'endroit le plus rétréci du pubis, et par conséquent de ne faire que difficilement une ouverture suffisante; d'un autre côté, celui de ne pas établir de parallélisme entre l'incision extérieure des tégumens qui est oblique, et celle du col de la vessie et de la prostate qui se trouve alors hori-

An Historical Sketch of Medicine in the Russian Empire, from the Earliest Period to the present Time. Communicated by Dr. von Embden of Hamburgh.

[From the Edinburgh Medical and Surgical Journal, for October, 1817.]

THE first medical man mentioned in Russian history was called Smer; he was physician to the Grand Duke Wladimir, had seen foreign countries, and lived in the tenth century. Before that time they very likely had no physicians. Distinguishing themselves by firm health, strength, hardiness, and simple regimen, they were subject to but few disorders; which, being simple in their nature, they cured with domestic remedies. The bathing-houses also were in use among them, and organized in the same manner as at the present time. As in the eleventh century Christianity was introduced into Russia, and in consequence of it convents were instituted, the monks began to practise physic for charity's sake. Sick wards were constructed in the convents, and Jeffrem, Bishop of Peregaslaw, erected in 1091 the first hospitals in which patients were gratuitously received. From the twelfth to the fourteenth century, we find indeed mention made of physicians, but no one of them is named except Peter the Syrian. Under the authority of the Tartars in the thirteenth and fourteenth centuries, the cultivation of sciences was at a stand; besides which, famine and the plague depopulated the country. In 1351, the black death, as it is called, coming into Russia, killed a vast number of people, and police regulations were entirely wanting at that time.

zontale. De-là la possibilité desinfiltrations par les obstacles que les urines trouveront à s'écouler."

I have also no doubt, that some of the worst instances of extravasations of urine after lithotomy, have been owing to another cause, pointed out by the same excellent surgeon. "Imprudemment porté dans la vessie, le gorgeret peut aller, par le stylet beaucoup trop long qui le termine, heurter, déchirer, perforer même la membrane de la vessie, et donner lieu à des infiltrations d'autant plus dangereuses, que le lieu d'ou elles partent est plus inaccessible." (See Œuvres Chirurgicales de Desault, par Bichat, Tom. II. p. 460—461.)

In the fifteenth century, after the expulsion of the Tartars, the cultivation of science was revived, but the treatment of the sick still rested with the clergy, there being as yet hardly any physicians. Iwan Wasiliewitsch, indeed, had one; and in 1483, sent emissaries to Rome to invite physicians to come to Russia. In this century, and particularly in 1499, syphilis made its way through Poland into Russia; besides which the plague, at intervals, still raged, and the leprosy still occurred. In the beginning of the sixteenth century, two very worthy foreign physicians, Nicolai Lugeo and Theophill, lived at the court of the Grand Duke Wasilei Iwanowitsch. After this, Czar Iwan Wasiliewitsch II. brought more physicians into Russia. It was in his reign that the Russian clergy stipulated in the consistory, held 1545, that it became the Czar, the metropolite, and the upper clergy, to tax the convents for the benefit of the aged and sick; and in 1360, hospitals were erected in many cities; and it is very probable that it was about the same time that the first apothecary's shop was set up in Moscow. In 1552 we find the first mention made of scurvy in that country.

In the reign of Fedor Iwanowitsch, in 1588, the first medical book was published. The original being written in Latin, a translation of it in Polish was published for Waiwaden of Frotyk at Krakow in 1423, and from that language into the Russian in 1588. It consists of 1561 pages, containing also drawings of plants, animals, and stones. In 1592, under the same reign, the erection of preventive buildings against contagious disorders was begun, by placing small quarantine guards on several frontiers. A forensic examination of the body of a neighbouring prince, under Russian protection, who had been poisoned, also happened about this time.

In the reign of Czar Boris Feodrowitsch in 1600, some more German physicians were called into Russia. Michael Feodrowitsch Romanow still more contributed to the promotion of physic in Russia. He enlarged the preventive measures against the plague, and ordained, in 1615, the first military physicians, and in 1620, the first medical, or rather apothecaries' board,(aptikarskoi priskas,) which was to ordain physicians and apothecary shops, and provide them with medicines. The board consisted of the archiater and the other physicians

of the court, was under the direction of the empire, and had a chancery and many officers. Ten thousand rubles were annually spent for the maintenance of the board and the apothecaries' shops. Native medicines were now also ordered to be gathered in different provinces of the empire, and to be delivered as a peculiar tax. Some native Russians went into foreign countries to study physic, and foreign physicians came to Russia. A selection thus becoming possible, those that did not give satisfaction were sent back, the others for the most part receiving situations at court, with adequate salaries. From 1645 to 1676, under the reign of Alexei Michailowitsch, military apothecary shops were instituted, military surgeons and under surgeons ordained, who were obliged to get into the routine. A distinction was made between physicians and surgeons, the first being called doctor, or dochtur, of which there were upper and under dochturs, the same as upper and under surgeons. Strong measures were taken against the plague, and strict quarantine enforced. Physicians were sent abroad on purpose to buy exotic remedies in Holland and England, and greater care was employed in collecting the native drugs, and botanical gardens were established. The woiwodes were charged with the reception of the herbs, and their delivery to the board of apothecaries. Notwithstanding all these establishments, there was, nevertheless, no settled foundation for physic in Russia, and physicians and surgeons were still obliged to acquire their technical routine by serving as assistants to foreign practitioners, and no foundation was laid for the elevation of physic till in the reign of Peter the Great. He erected a medical board, which, in 1707, received the name of Apothecaries' Chancery, was removed to St Petersburgh, and received, in 1714, a sum of fifty thousand rubles, in order to buy foreign medicines, and to remunerate its medical officers.

In 1721, all hospitals and apothecary shops, as well those belonging to the crown as the private ones, were placed under its superintendence, and all unprivileged medical practitioners were interdicted the practice. In 1725 this board received the name of Medical Chancery, and was only called Medical Board for the time when the court and archiates were at Moscow passing ukases.

The establishment of the chief military hospitals in 1706

gave the first opportunity for institutions for medical instruction. These hospitals were to be provided with the ablest physicians. Each of them received a few under-physicians, assistants, and pupils; besides which, they were obliged to take many young Russians as apprentices, and instruct them in anatomy, pharmacology, and surgical operations; besides which, they were instructed in Latin and drawing. These pupils were afterwards, according to their abilities, made under-physicians, or physicians (Leckar). There were three medical schools of that description at the various hospitals of St Petersburg, Moscow, and Kronstadt. In 1715, the Great Admiralty Hospital was built on the borders of the Neva, at St. Petersburgh, with a church in the centre, and an anatomical theatre in each wing.

According to the military code, made by the Czar himself, each division received, in 1716, a doctor and a surgeon to the staff, each regiment a physician (Leckar), and each company an under-surgeon (Ziralaick); the whole army two field-apothecaries, one for the cavalry, and one for the infantry; each of them provided with two assistants and four apprentices.

Peter further ordained the establishment of foundling-hospitals in Moscow and other cities. A similar institution had already previously been established at Great Nowogarod, through the exertions of Bishop Zow.

A cabinet of anatomy and natural history, and a medical library, were now brought from Moscow to St. Petersburgh. The natural curiosities had been partly collected in Russia, and partly by Peter, on his travels in Holland, in 1698. The museum was afterwards increased by the addition of that fine collection of the apothecary Seba, at Amsterdam, which was purchased for fifteen thousand florins; and, in 1717, by the famous Ruysch's museum, which was bought for thirty thousand florins. Ruysch confided his secret of injecting and embalming to the Emperor, who communicated it to the archiater Blumentrast, who, in his turn, entrusted it to the inspector of the anatomical preparations, Schumacher. He again imparted the secret to the Archiater Rieger; who afterwards, on his leaving the Russian dominions, made it publicly known. In order to increase the museum, it was enacted, that from the whole em-

pire, all the monstrosities should be sent to St. Petersburgh, for which rewards were offered by government. Travels were undertaken for the improvement of Russian natural history. In 1719, Dr. Messerschmidt was sent to Siberia for that purpose, where he staid eight years. He learned the Tangutanian and Mongolian languages, from the Tangutanian Lamas, and gave convincing proofs of his activity in his ornithology and ichthyology. Dr. Buxbaum, who, in 1719, had entered the service, went, in 1724, with the Russian embassy to Constantinople, and returned from thence through Natolia and Persia, over Astrachan, and published his botanical observations. The Russian mineral waters now also began to be investigated; and now the native Russians began also to treat physic as a science.

As in 1726, under Catherine I., the Imperial Academy of Sciences was established, many physicians of note were called into Russia, among whom were Duvernoy, Burges, Weilbrecht, Kaau Boerhaave, Wolf and Protassoff; the latter was a native of Russia, and pupil of Boerhaave. Under the reign of Anne, from 1730 to 1740, many acts relating to physic were passed. In 1733, the sale of poison in the grocers shops was prohibited. In 1735, the duties of the physicians of hospitals were stipulated. In 1736, the construction of the field apothecary shops was improved, and four of them in Dubnow, Smolensk, Riga, and Wyburg, appointed to follow the army in time of war. In 1737, physicians were appointed in different cities with a fixed pay; and, in 1738, one for the poor at St. Petersburgh, whose duty it was to attend daily at the principal apothecary shop, in order to prescribe for the sick that came thither. Besides, this science received at that period considerable improvements through Heinzelman, Siegesbeck, J. G. Gmelin, Steller, and others; and Hahnhardt and Von Wellen published, in 1744, the first anatomy for the use of the pupils of the military hospital at St. Petersburgh. In 1754, in the reign of the Empress Elizabeth, the University at Moscow was established, and increased attention was paid to midwifery. In 1755, one physician and two surgeons were appointed for curing small-pox, measles, and other contagious and cutaneous disorders in St. Petersburgh; and, in the same year,

the first publication on inoculation made its appearance, though it was not practised till the year following.

In 1756, a library was joined to the Medical Chancery, and, in 1758, Bestucheff's drops drew upon them the public attention. The archiater Paul Zachariewitsch Cordoidi caused the best medical books to be translated into the Russian language, by Martin Schein, head surgeon to the Admiralty Hospital; in 1757, Heister's anatomy; and, in 1762, Plattner's surgery. He also caused young Russians to be sent abroad to study physic, which, however, was not effected till after his death in 1762. In 1763, Catherine II. established the Imperial College, which she divided into two departments, one directing the learning, and the other, under the appellation of the Chancery, the economical part. It consisted of six assessors, who worked under one president, and the college at Moscow also had one president and two members, constituting what was called the board. This college contributed much to the improvement of medical schools; the hospitals were also better organized; new apothecary shops were established; the number of botanical gardens increased, the Siberian rhubarb plantations extended; acts passed respecting the keeping up of the military apothecary shops in time of peace, and respecting the collecting of native remedies, &c.

In 1763, a scientific medical society was established at St. Petersburgh, which assembled once a week for the sake of artificial (oral?) communications, and to receive written communications from members from abroad; but this lasted only five years. In 1765, a free economical society erected at that place, was confirmed by the Empress in the following year, and is still in existence. Many able physicians contributed, by their works, and treatises on contagious disorders, dietetics, popular medicine, and the plague among animals, to the accomplishment of their aim. In this year, the Medical College published their first Dispensatory. Inoculation, likewise, which had begun already in 1756, now became general throughout all Russia, the Empress and the Crown Prince having given the example in 1768. Houses were erected for that particular purpose at St. Petersburgh, Kozen, and Irkutzk.

As the empire had now been divided into governments, phy-

sicians and surgeons were appointed in each different government, and hospitals erected in the chief of them. The want of medical men being increased by these measures, they wrote for a number from Germany.

In 1768, Catherine desired the naturalists to cultivate the natural history of Russia, and supported them most generously in it; by which Pallas, Falk, Gmelin, Lacman, and others, were induced to devote particular study to that science.

In 1769, the lady of Prince Dimitrei Michailowitsch Galizin, daughter of Prince Kantemir, fixed a legacy, by which three native Russians were to be sent to, and supported at Strasburgh, in studying physic.

In 1770, as the plague raged in many parts of Russia, as well as in Moscow, Saafonsky, and Stamoilowitsch, Oreans and Melzer published their observations on the nature and treatment of that distemper.

In 1778, the Medical College published their second Dispensatory, Pharmacopoeia Russica, and in the next year, the Military Dispensatory.

In 1783, the Medico-Chirurgical Institution was established at St. Petersburgh. This was independent of the Medical College; stood in scientific respect only under a director, surgeon Kelcher, and in economical respect under the chief master of the police of St. Petersburgh, but received afterwards a separate chief director. Thirty pupils were there instructed at the expense of the Crown, and almost as many studied on their own expense. The institution was meant originally for natives only, but most of the teachers being Germans, and the greatest part of the pupils natives either of the German Russian dominions, or proper Germans, the lectures were in the beginning delivered in the German language. The institution had two clinical schools, and one for midwifery. This medical establishment being confirmed in 1786, the surgical schools at the military hospitals also received a better organization. The instruction was extended, and the number of pupils maintained by government fixed at 150, and any one studying at his private expense, had a free admission to the lectures, besides that they were to be boarded and clothed for 80 rubles a year. In this new establishment, the objects of medical instruction

were fixed upon for the future, and a sum of 248,760 rubles were stipulated for the support of the whole. At that period, thirteen military and seven navy hospitals were under the direction of the college.

In 1788, a society formed at St. Petersburgh, under the superintendence of a Lutheran divine, Provost Larupe, who, from notions of philanthropy, undertook the treatment of the poor in their private habitations; it existed 12 years.

The Medical College, which hitherto had only had a president, now received an upper director in the person of Mr. De Wittinghofen, under whose direction a medical rate and order was published for the apothecaries and midwives, in the Russian and German languages. It was about the same time that the upper apothecary, Lowitz, made the discovery of preserving water from putrefaction, and freshening it when corrupted, by charcoal.

In 1791, the first institution for the recovery of drowned people was established. In 1793, a society of physicians at St. Petersburgh began to publish a medical newspaper in the Russian language; and, in the same year, the University of Moscow received by an ukase the privilege of conferring the doctoral degree, which had hitherto belonged only to the Medical College.

Under the direction of Count Alexei Iwanowitsch Wasiliei, who, in 1793, came to the upper directorship of the college, professorships of midwifery, mathematics, and natural philosophy, were instituted, the number of professors increased, adjuncts added to them. In 1796 clinical institutions were opened in the military hospitals, the medical examinations were made stricter, and the students divided in classes, for the purpose of rendering their studies methodical. The college library was considerably increased; the anatomical, surgical, and chemical cabinets of the medical schools enlarged, and natural, philosophical, and mineralogical ones established. The physicians of governments and districts, who hitherto had stood under the governors, were placed under the immediate direction of the college. The manufacture of surgical instruments was so improved, that it did not yield to the best foreign one; and a printing-office was established, in which a vast

number of medical books, both originals and translations, appeared. At this same period, descriptions of the mineral waters near Baldahn, in Courland, and near Constantinegorsk, near the Kaukasus, made their appearance.

Soon after Paul I. began to reign, the physical board underwent considerable improvements, and stricter attention was paid to the public health, the hospitals and apothecaries' shops in the provinces, by establishing a medical board in every government city, in the year 1797. Each of them had a director, an operator, and an accoucheur, and the members were bound to publish physical and medical topographical descriptions of their governments.

In St. Petersburgh an institution for midwives was also established, in which 22 female scholars were under one physician-accoucheur or professor of midwifery, one surgeon, and one midwife of greater experience. Midwives were also appointed in the government and district cities, the eldest of whom received 120, and the younger ones 80 rubles annually. In the same year, it was ordered that 30 scholars be sent annually from the theological seminaries to the schools of physic, and a separate school was erected on the Apothecaries' Isle at St. Petersburgh, for the preparing of young men to the study of physic. The medical schools now receiving pupils that were scientifically prepared, and the professorships being supplied with native Russians, two medico-chirurgical academies were established at St. Petersburgh and Moscow, in 1799; but the latter was, like that of the medical school at Kronstadt, united with the former. Medical jurisprudence now was added to the sciences that were taught before, and the number of students in both academies amounted to 240. They were divided into disciples and students, and, in order to prolong their time of study, their places in the military hospitals were supplied with petty surgeons.

In 1800 the academy was entirely separated from the military hospitals, with which it had hitherto been in close connection, and was removed to a building erected on purpose for it.

In 1801 the first successful attempt was made with vaccination in the foundling-hospital at Moscow; and in the same

year the college published a treatise on the utility of it. Dr. Boutaz was commissioned to introduce vaccination in the provinces, the medical boards being desired to contribute to the general distribution of so useful an invention; and it is really surprising how readily even the lowest class met this arrangement.

In 1802, with the establishment of the new ministry under Alexander I. the medical college was placed under the ministry of the interior, and the medico-chirurgical institute was combined with the medico-chirurgical academy. A medico-philanthropic committee was also established at St. Petersburgh, which had, 1st, the attendance of sick paupers at their private abodes; 2d, the gratuitous dispensation of medicines; 3d, assistance in casualties that happened in the street; 4th, the erection of separate hospitals for contagious patients; 5th, the keeping of the maimed, and educating the deaf and dumb, &c. for its aim. This committee afterwards also paid attention to the numerous diseases of the eyes, for which a separate infirmary was established, first with 10, and afterwards with 100 beds; a separate accoucheur was also paid for attending on the poor. The number of members belonging to this society, in and out of the metropolis, is uncertain. Besides 1500 rubles, which were given in the beginning to the establishment, the government treasury contributed annually 5400 rubles, and the imperial treasury 24,000 rubles, besides which considerable contributions flowed in to the fund from individuals.

In the same year an edict was passed, that popular medicine was to be taught in the theological seminaries, in order to enable the clergy to assist the sick in those places where there was no physician.

In 1803 an imperial medical board was erected in the room of the medical college, and consisted of two divisions. The first is called the medical council, and its object is every thing connected with learning tending to the improvement of physic; the second is called the medical expedition, forming the third expedition of the ministry of the interior, and has for its object the special and economical affairs of the medical board.

In the same year, the erecting of veterinary schools was proposed in St. Pètersburgh, Moscow, and Lubum.

In the same year, the universities of Wilna and Dorset, and in 1804, those of Charhow and Kasan, were established. In the last year, the mineral waters at Lipetyk, in the Tambow government, were examined, and appropriated to the use of the sick; arrangements were also made against the yellow fever, which began showing itself in some parts of Europe, and Guyton-Morveau's method of fumigation was made publicly known.

In 1805 the army medical board was placed under the ministerium of war, and physician and surgeon generals of the staff, and a proper number of chancery officers were appointed for the army and navy. The military divisions received medical inspectors and vice-inspectors. The duties of the army medical men were more exactly pointed out, and honorary and pecuniary rewards were fixed for them. According to the military medical *etat*, published in 1805, there were at that time 2597 physicians and under-physicians for the army and military hospitals, who received 488,605 rubles salary; and 1288 for the navy, sea-ports, and navy hospitals, who received 215,403 rubles.

All military apothecary shops, and those belonging to the head admiralty, were placed under the ministry of the war department; but those from which the apothecary shops of the army and navy were to be supplied with medicines, were placed under the direction of the medical expedition.

A physican-general of the staff was also appointed for the civil. The anatomical cabinet of the medico-chirurgical academy was increased; the form of the surgical instruments in most common use was revised and improved; books in all the branches of physic were published; and the number of pupils educated at the academy and former medico-chirurgical establishment, who received afterwards appointments, between the years 1799 and 1808, amounted to 807.

In 1808 Dr. Rehman described the Turkish mineral waters near the Baikal. In this year an alteration was made in the medical expedition of the war department, a director and two counsellors being appointed, with a proportionate number of

chancery officers, in place of the physicians and surgeons general of the staff.

The medico-chirurgical academy was divided into two divisions, that of St. Petersburgh and that of Moscow. In each of them a veterinary school, and one for apothecaries, was established, and its professors received the same rights and pay with those of the universities. The number of those studying at the expense of government was extended to 720. To remove any impediments to the study of physic, it was, under certain conditions, even permitted to receive such as were born in bondage. The members of the medical council were made perpetual honorary members of the academy. The medical dignities were divided in degrees, and the prerogatives of each fixed. The academy received the epithet Imperial, and its annual etat was fixed at 386,290 rubles. Physicians had before this already been sent abroad to study veterinary medicine. On their return, the building for the veterinary school being completed, it was opened in 1808, professors appointed for its various branches, and pupils received.

In 1809 a medical directory, or a register of all the physicians in the Russian empire, was published, according to which their number amounted to 2596, of whom 1187 were native Russians.

In 1810 the medical expedition was removed from the ministry of the interior, and placed under the minister of the police, whilst the medical council and the academy remained under the immediate direction of the minister for public instruction. A regulation also appeared respecting the principles according to which the incapacity for military service was to be judged of, as also another, respecting the examination of physicians, surgeons, midwives, and apothecaries.

A Description of the Laurus Cinnamomum. By Henry Marshall, Esq. Staff Surgeon to the Forces in Ceylon. Communicated to the Royal Society of London by the Right Hon. Sir Joseph Banks, Bart. G.C.B. P.R.S.

[From the Annals of Philosophy, for October, 1817.]

The laurus cinnamomum belongs to class Enneandria, order Monogynia, of the Linnæan arrangement of plants; specific character, "foliis trinervis, ovato-oblongis, nervis versus apicem evanescentibus."

Roots branchy and ligneous. The bark of the roots has the pungent smell of camphor, with the delicious odour of cinnamon; yields camphor by distillation; wood light, fibrous, and inodorous.

The tree grows to the height of from 20 to 30 feet. Trunk from 12 to 18 inches in diameter; irregular, knotty, covered externally with an ash-coloured, thick, rough, scabrous bark; inner bark reddish. The bark of the young shoots is often beautifully speckled with dark green and light orange colours.

Branches numerous, strong, horizontal, and declining. Branchlets cross-armed.

Leaves oblong; from six to nine inches long, and from two to three broad; both ends sub-acute; entire, flat, three-nerved, lateral nerves vanishing as they approach the point; smooth; superior surface dark green, shining; inferior, green; grow in pairs, opposite, crossed.

Petiole half cylindrical, slightly channelled above, about three fourths of an inch long; has the odour and taste of cinnamon.

Peduncles many-flowered, long, lateral, and terminal; flowers hermaphrodite, white; calyx none; corolla six-cleft; stamens nine.

The fruit is an oval berry, larger than a black currant; adheres to the receptacle, like the acorn; the receptacle is thick, green, and hexangular; when ripe, the skin is bluish-brown, thickly scattered with white spots; under the skin is a greenish pulp, slightly acrid, has a terebinthine odour, and tastes in some degree like the berries of the juniper. This pulp covers

a thin, tough shell, which contains an oily, soft, pale, rose-coloured, inodorous kernel. The tree emits no smell.

The young leaves have in general a scarlet or light-liver colour, with yellow veins; as they acquire maturity they become olive, then green, and before they fall olive-yellow: mature leaves, when bruised, have a strong aromatic odour, and the biting sharp taste of cloves.

Crows and wood-pigeons devour the berries with great avidity: the productive quality of the seeds remains undestroyed; and by this means the plant is disseminated to a great extent of country, and is found even in the thickest and most impassible jungles.

Buffaloes, goats, deer, and horses, eat the leaves with great eagerness.

The flowers appear in January and February; and the seeds ripen in June, July and August. The odour of the flowers is to people in general disagreeable; to many it is like the scent exhaled from newly sawn bones; to others, with St. Pierre, "the flowers of the cinnamon-tree smell like human excrement."

The prepared bark of this tree is the highly esteemed spice cinnamon, which is perhaps the most useful, certainly the most generally grateful, of all the aromatics.

Thunberg, who visited Ceylon in 1775, and who has given a fuller account of the cinnamon-tree, and of the preparation of cinnamon, than had been published before his time, appears to have obtained his information respecting the tree chiefly from Burman and the chaliahs, or cinnamon-peelers. He has enumerated a number of sorts of laurus cinnamomum. His distinctions are not founded either on an external or internal variation of the plant, but on a real or supposed difference of the taste, flavour, &c. of a preparation of its bark. His first five sorts are the produce of the laurus cinnamomum, and have obtained from the chaliahs the following characteristic denominations: rasse kurundu, nai kurundu, capura kurundu, cahatte kurundu, and sevel kurundu; from the Cingalese adjectives, rassi (sweet), nai (acrid or snake), capuru (camphoric), cahatte (astringent), sevel (mucilaginous). These distinctions are arbitrary and comparative, imaginary, and ill-defined.

Two peelers rarely ever agree in giving the same denomination to a similar piece of cinnamon. The diversities of the quality of cinnamon do not appear to arise from any varieties of the plant, but from care and skill in its preparation, the soil and exposure of the country, the age and health of the plant. The cinnamon-tree is rarely found except on the south and west aspect of the island, It is chiefly procured between Negombo and Matura: beyond these limits the bark is never of a good quality; it has little taste, and is greatly deficient of the spicy aromatic flavour of the cinnamon. Even between these limits the cinnamon is not of the same quality; exposure, soil, shade, and other circumstances, have powerful effects in producing a corresponding variety of the excellences and defects of the produce of the tree.

The dawul kurundu of the Cingalese is divided by Thunberg into two species,* and form his sixth and seventh sorts. His eighth, ninth, and tenth sorts, do not belong to the laurel genus.

The dawul kurundu, nika dawula, and nika kurundu, of the Cingalese (*laurus cassia*, Linn.) abounds in many parts of Ceylon.

The trunk of the dawul kurundu is branchy and crooked, leaves ovato-lanceolated, entire, from four to six inches long, and from one to two inches broad; three nerved; the lateral nerves terminate before they reach the point of the leaf, and join the middle one; above the petiole smooth, alternate; upper surface dusky-green; under surface pale grey; petiole half cylindrical; flat above; flowers inodorous, whitish, verticillated, sessile; calyx common; four-leaved; leaves roundish, concave; contains five distinct flowers with short peduncles; corolla six-petalled, ovato-concave, nearly equal; filaments nine, shorter than the corolla; stile short; stigma obtuse; berry black, round, and about the size of a large currant. Under the skin of the berry is a bitterish pulp which separates easily from a thin, fragile, membranous pellicle, that contains an excessively bitter kernel, one seeded.

* This division he has copied from Burman, who, from two synonymous appellations for the same plant, made two sorts or varieties of it.

The bark of the root is extremely bitter; the leaves, and the bark of the trunk, and branches, are bitter, and have in a very slight degree the taste and odour of myrrh.

This is the cannella de matto of the Portuguese, the wilde caneel of the Dutch, and the laurus myrrha of Loureiro.

Dawul kurundu in the Cingalese language means drum cinnamon; and authors have asserted that drums and tubs were made out of the wood of this tree. I have not been able to find that any use is made of the dawul kurundu in Ceylon, either in medicine, or for economical purposes.

The karuwa, or karua, of the Malabar coast, has in several botanical works been classed as a synonyme with the dawul kurundu. It has been so classed in Willdenow's edition of the Genera Plantarum. Whether we contemplate the ample description of the karuwa by Govenor Van Rheede, or examine the quality of its prepared bark, no specific difference can be discovered between the cinnamon-tree of Ceylon and the karuwa of the Tamools.

The similarity of the appellations by the people of Ceylon and the Malabar coast strongly support this opinion. The Tamool name for cinnamon is karua puttay, or bark of the karuwa; the Cingalese term is kurundu potto, the bark of the kurundu, or kurundu gaha: one of these terms appears to be a corruption of the other, although it be not evident which of them is the original.

The prepared bark of the karuwa is, according to good authority, inferior to the best Ceylon cinnamon. It is, however, allowed to be superior to the produce of the cinnamon-tree which is found in the northern and eastern part of the island.

It is difficult to conceive how the dawul kurundu obtained the appellation of laurus cassia by Linnæus, and had qualities attributed to its bark which it does not in the slightest degree possess. Linnæus appears to have been misled by the works of former botanists. Paulus Hermanus was physician to the Dutch settlements in Ceylon, and was one of the first who described the plants of the island. Many of his descriptions are inaccurate and defective. Burman copied his inadequate description of the cinnamon-tree, but little improved, into his

Thesaurus Zeylanicus; from which Linnæus transferred it into his Flora Zeylanica.

The following circumstance may have very materially contributed to the misconception of Linnæus.

In Burman's Works, Plate XXVII. is delineated a figure of the laurus cinnamomum; and another drawing of the same plant, differing in no essential circumstance, is given in Plate XXVIII., but which Burman has by mistake asserted to be the dawul kurundu. Burman observes that Herman's description of this plant is obscure and unsatisfactory; and seems to have perceived the incongruity of his own plate with the description added, which is probably chiefly taken from Herman.

It is evident that Burman was undecided in his conjectures respecting the qualities of the dawul kurundu, and leaves the subject to be determined by those who had an opportunity of examining the plant in its native soil. Linnæus may by this mistake have been misled, and confounded the two plants by assigning the aromatic qualities of the laurus cinnamomum to the dawul kurundu, which has perhaps by this means obtained the name of laurus cassia.

Burman has been equally unfortunate in enumerating two other species of cinnamon under the denomination of kurundu pelle and kurundu ette. The first term specifies, in the Cingalese language, a young cinnamon plant; the second, the seed or berry of the cinnamon-tree.

Thunberg followed next. It is not evident that he perceived Burman's mistake; he certainly did not rectify it; and his authority has tended to confirm the errors of his predecessors. He seems to have confounded the dawul kurundu, laurus cassia (the wilde caneel of the Dutch), with the natural or uncultivated cinnamon-tree which grows spontaneously in the woods. When Thunberg means to describe the prepared bark of the laurus cassia, he gives the correct distinctive marks of the prepared bark of the trunks and branches of cinnamon trees too old to afford good cinnamon. He says, "the laurus cassia yields a coarse kind of cinnamon, and seems to be merely a variety of the former," (the laurus cinnamomum): again, "It is probable that the coarse and finer cinnamon, or the laurus cinna-

momum and cassia, are merely different varieties, arising from the climate, and especially from the soil."

Mr. Forbes, in his Oriental Memoirs, seems to have also confounded the two plants, and applies the term cassia to the laurus cinnamomum. His words are: "The leaves of the cassia are smaller than the laurel, and more pointed. Those of the cinnamon still more delicate; the blossoms of both, like the flowers of the arbutus, hang in bunches, white, and fragrant; the fruit resembles an acorn. The young leaves and tender shoots are of a bright red, changing to green as they approach maturity; they taste of cinnamon," &c. This is an exact description of the cinnamon-tree, not of the laurus cassia.

The dried leaves of the cinnamon-tree have an olive-yellow colour. They are shining and glassy; thick, crisp, and durable; the three nerves are protuberant on the inferior side of the leaf; they endure for several weeks the heat and rains of a tropical climate, without losing their spicy aromatic taste; they have in a considerable degree the acridity and flavour of cloves. Commelinus informs us that they afford oil of cloves by distillation. They give an excellent simple, and spirituous water, and an essential oil, according to Dr. Dancer. In Cayenne they are employed in the distillation of rum, to improve its flavour.

Is the leaf of the cinnamon-tree the malabathrum folium or folium indicum of the ancients? Tamala patra is the Sanscrit appellation for cinnamon, of which term malabathrum seems to be only a varied pronunciation, or slight corruption. I am aware that some authors are of opinion that the malabathrum folium is the produce of the laurus caryophyllus, laurus kulit cawang, and that others assert that it is the leaf of the piper betel.

The leaf of the piper betel does not possess the qualities ascribed to the folium indicum. When fresh pulled the betel leaf is soft and succulent, and very soon loses its acrid quality. By drying, it becomes thin, flexible, tasteless, and inodorous. The natives rarely use it when more than two or three days pulled. The malabathrum was held in high estimation by the Greeks and Romans as a perfume, and it entered into the composition of their aromatic unguents.

The cassia bud of commerce is the fleshy hexangular recep-

tacle of the seed of the laurus cinnamomum. When gathered young, the receptacle completely envelopes the embryo seed, which progressively protrudes, but continues firmly embraced by the receptacle. The buds have the appearance of nails, with roundish heads of various sizes. If carefully dried, the receptacle becomes nearly black, and the point of the berry light-brown. The seeds contract by drying, and often fall out; the receptacle is then cup-shaped. When long kept they have a dirty-brown colour, and possess very little of the aromatic flavour of cinnamon. The Tamul name for cassia buds is sirnayapoo or sirnahapoo; Cingalese, kurundu ette; Dutch, kassia bloemen; French, fleurs de la cannelle.

Cassia buds possess the same properties with cinnamon, though in an inferior degree. By distillation they yield an essential oil, not inferior to that which is prepared from cinnamon.

The confectioners use them in the composition of conserves.

Cassia buds are not prepared in Ceylon.

By decoction, the ripe seeds yield a suety substance, which is perfectly inodorous, and has no very considerable degree of inflammability. The natives sometimes extract this substance, and employ it as a liniment for external bruises, &c.

Cinnamon thrives best in a situation rather elevated, and in a sandy loam, mixed with the earthy remains of decayed vegetables. In the rubbishy soil near houses it is uncommonly succulent. The shelter afforded by buildings appears to contribute to its luxuriance.

The ground for planting cinnamon is in the first instance prepared, by cutting down the low brush-wood and young trees. The lofty trees are allowed to remain, as the cinnamon is observed to thrive better under their shade, when not too close, than when it is exposed to the direct rays of the sun. The brush-wood is collected into heaps, and burned. The planting commences when the seeds are ripe, generally during the months of June, July, and August. The workmen stretch a line upon the ground, along which they with a mammettee (hoe) turn up about a foot square of earth, at intervals of six or seven feet. The ashes of the burned shrubs and branches of trees are then spread upon the spots of friable earth; and into each of them four or five cinnamon berries are planted with

a dibble. Branches of trees are spread upon the ground, to prevent the friable earth from being scorched, and to protect the young shoots. The young shoots appear above the ground in about 15 or 20 days. Sometimes the berries are sown in nurseries, and the shoots transplanted in the months of October and November.

In favourable situations the shoots attain the height of five or six feet in about six or seven years; and a healthy bush will then afford two or three shoots fit for peeling. Every second year from four to seven shoots may be cut from a bush in a good soil. Thriving shoots of four years' growth are sometimes fit for cutting.

As four or five seeds are sown in one spot, and as in most seasons many of the seeds germinate, the plants grow in clusters, not unlike a hazel bush. In seasons with little rain many of the seeds fail, and a great number of the young shoots die; so that it is frequently necessary to plant a piece of ground several times successively. A plantation of cinnamon, even on good ground, cannot be expected to make much return before eight or nine years have elapsed.

The plantations from which a considerable part of the cinnamon is procured are Kaderang, Ekele, Marendahn (Colombo), and Morotta.

These are styled protected plantations, to distinguish them from a number of extensive fields that were planted with cinnamon by the Dutch, and which have since been permitted to be overrun with creepers, brush-wood, &c. and many of the cinnamon plants rooted up by the natives.

Kaderang is situated in the neighbourhood of Negombo, and contains about 4,106 acres. A few small pieces of ground belonging to private individuals are included in this statement. A very considerable portion of this plantation is marshy and unproductive. There are about 1623 acres which bear cinnamon; and this number is annually increasing. Kaderang, on an average of ten years, produces annually about 535 bales of cinnamon.

Ekele is situated 10 miles north from Colombo, and contains about 1598 acres of ground of an excellent soil, which is

not entirely planted; but the cinnamon is reckoned to be of the finest quality. The annual produce is about 341 bales.

Marendahn is situated in the immediate vicinage of Colombo, and contains (including a number of small fields belonging to private individuals) about 3824 acres of ground well adapted for the cultivation of cinnamon. More attention has been paid to this plantation than to any of the others: it is nearly completely planted, and produces annually about 1124 bales.

Morotta lies seven miles south from Colombo; and is about the same extent as Ekele. Little attention is paid to the cultivation of this plantation. It yields annually about 218 bales.

The jungle and neglected plantations in the neighbourhood of Colombo and Galle afford a large quantity of excellent cinnamon.

The Candian country has continued to furnish annually a quantity of cinnamon. The King did not grant permission for the chaliahs to enter his territory; but they contrived to make short excursions into it; and by stealth, bribery, or sufferance of the headmen, succeeded in obtaining a considerable quantity of bark, which they prepared at their leisure, after leaving the Candian limits: occasionally they suffered for their temerity, but not often.

On an average of 10 years the quantity of cinnamon deposited annually in the magazine of Colombo from the jungles and abandoned plantations of our own territory, including what has been collected in the Candian country, amounts to 1184 bales; and at Galle, during the same period, 935.

The peeling commences early in May, and continues until late in October. The rains which precede, and occur during the southwest monsoon, produce such a degree of succulency in the shoots as to dispose the bark and wood to part easily.

The setting in of the rainy weather immediately produces a fresh crop of scarlet or crimson-coloured leaves.

The cinnamon harvest begins by dividing the peelers into small parties, which are placed under the direction of an inferior superintendant. When they are to peel in the plantations, each party has a certain extent of the plantation allotted to it. A few of the party cut shoots, while the remainder are employed in the wadu (or peeling shed) to remove the bark and

to prepare the cinnamon. When the chaliah perceives a bush with shoots of a proper age, he strikes his ketta (which resembles a small bill-hook) obliquely into a shoot; he then gently opens the gash, to discover whether the bark separates easily from the wood. Should the bark not separate easily, the shoot or branch is not deemed fit for cutting. The chaliahs seldom trust implicitly to any external mark of the proper condition of the plant, and rarely try a shoot until the scarlet leaves have assumed a greenish hue. Some plants never acquire a state fit for decortication. Shoots of many years' growth often bear the marks of numerous annual experiments to ascertain their condition. Unhealthy, stunted plants, are always difficult of decortication; and the cinnamon procured from them is generally of an inferior quality.

The peelers do not cut shoots or branches whose diameter is much less than half a inch, or more than from two to three inches.

To remove the bark, the peeler commences by making with his kokette, or peeling knife, through the bark, a longitudinal incision, of which the length is determined by the figure of the shoot. A similar incision is made on the opposite side of the shoot, and when the branch is thick the bark is divided in three or four places. The kokette is next introduced under the bark, which is gradually separated from the wood, and laid aside. When the bark adheres firmly to the wood, the shoot is strongly rubbed with the handle of the kokette. These sections of bark are carefully put one into another, the outer side of one section being placed in contact with the inner side of another, and are then collected into bundles, and firmly pressed or bound together.

In this state the bark is allowed to remain for 24 hours, or sometimes more; by which means a degree of fermentation is produced that facilitates the subsequent operation of removing the cuticle. The interior side of each section of bark is placed upon a convex piece of wood, and the epidermis, with the greenish pulpy matter under it, is carefully scraped off with a curved knife. During the operation the peeler sits upon the ground, and keeps the bark steady upon the piece of wood with his heel or toes. The bark dries, contracts, and gradually

assumes the appearance of a quill or pipe. In a few hours from the time the cuticle is removed, the peeler commences to put the smaller tubes into the larger, and introduces also the small pieces. By this means a congeries of quills is formed into a pipe, which measures about 40 inches long. The cinnamon is suspended in the wadu upon open platforms for the first day. The second day it is placed in the sun, on wicker shelves, to dry. When sufficiently dry, it is collected into bundles of about 30lb. weight each, and in this state deposited monthly in the Government magazines at Colombo or Galle.* When newly prepared, cinnamon has a most delicious odour: this odoriferous quality becomes gradually fainter. Cinnamon is at first a light-orange colour, which becomes a shade darker by exposure to the air. The bark of old trees acquires a reddish-brown colour.

Shortly after the cinnamon is deposited in the store-houses, the inspection of it commences. The East India Company employ an inspector and two assistants to superintend the sorting and baling of the cinnamon. The manipulation is performed by natives. Each bundle is placed on a table or large bench; the bundle is untied, and the cinnamon examined quill by quill. It is divided into a first, a second, and a third, or rejected sort. The first and second sorts are alone deemed of a quality fit to form the Company's investment. The sorting of cinnamon consists chiefly in detecting or separating what is coarse, and otherwise of a bad quality, including the impositions of

*From Baldeus's print of the manner of peeling cinnamon, and also from his description, it would appear, that during his residence in Ceylon the bark was removed from large trees, and the trunk allowed to remain uncut. Captain Percival, who published his account of Ceylon nearly 200 years afterwards, has only copied and reduced the Rev. Gentlemen's print, and rendered it confused, by including in the same plate another print from the same author, showing the costume of the native women, and their manner of making butter. Many authors subsequent to Baldeus have asserted that the decorticated stump regained a new bark. I was, however, surprised to find the following passage in a manuscript memoir on the cultivation of cinnamon, addressed to Mr. North, while Governor of Ceylon, by Mr. Jonville, Superintendent of Cinnamon Plantations: "Your Excellency remembering that some travellers had advanced that the bark of the cinnamon is taken off the branch growing from the trunk, and that it grows again, ordered me to try that: I did so on several plants; but they all died."

the peelers. This is chiefly performed by inspection. Habit soon enables the people employed to discover by a single glance of the eye what is considered defective. Tasting is very rarely had recourse to.

The bark of the large shoots, or thick branches of trees, produces coarse cinnamon, which is generally rejected by the sorters. This cinnamon is thick, and has a reddish-brown colour, rough surface, loose texture, and is coarse-grained. It breaks short, shivery, and crumbling. When chewed it is disagreeably pungent, feels gritty, ligneous, and sandy, in the mouth.

The peelers occasionally scrape off the external pellicle of this quality of cinnamon. This operation thins the cinnamon and improves the colour, but leaves it with a coarse, rough surface. This quality of cinnamon is always rejected.

Cinnamon prepared from the bark of very young and succulent shoots is rejected. It is light straw-coloured, thin, and almost without flavour or taste; and what little aroma it possesses is very evanescent.

Mildewed or half-rotten and smoky cinnamon is rejected. When the peelers are overtaken with rain at a distance from sheds, the bark they have previously collected ferments, becomes decayed, and inodorous. In such situations they frequently retire to caves, or very confined huts, where they kindle fires, to procure warmth and to dress their food. The smoke arising from these fires often greatly injures the bark, and renders it unfit to be manufactured into good cinnamon. To increase the weight, the peelers sometimes stuff the quills of cinnamon with sand or clayey earth, thick ill-prepared pieces of bark, &c. &c. When these impositions are suspected, the quills are undone, often broken, and the foreign mixtures removed.

This is one of the many causes which prevents the cinnamon from being in quills of nearly equal length. Cinnamon produced beyond the river Keymel on the north, and the Wallawey on the south,* is generally condemned. It is light-co-

* Good cinnamon is found on the southern portion only of the island. The district which affords it appears to lie to the south of a line stretching from a few miles of Negombo to Panama, a station 18 miles north of Kandy, and from Panama to the neighbourhood of Hambangtotte.

loured, greatly deficient in aromatic flavour, astringent, bitter, and has sometimes a taste similar to the rind of a lemon. Even between these limits the cinnamon produced differs greatly in quality. Differences of soil, and exposure, are very evident causes of a difference in the quality of cinnamon. Shoots exposed to the sun are more acrid and spicy than the bark of those which grow under a shade. A marshy soil rarely affords good cinnamon. It has often a pale yellow shade, approaching to the colour of turmeric. It is loose, friable, and gritty, and its texture coarse-grained. It possesses little of the spicy taste of cinnamon. Very often, however, the cause of the inequality of this spice is not apparent; the bark of different shoots of the same bush have often very different degrees of spiciness.

That which is considered in Ceylon as of the best quality is of a light yellow colour, approaching nearly to that of Venetian gold; thin, smooth, shining; admits of a considerable degree of pressure and bending before it breaks; fractures splintery; has an agreeable, warm, aromatic flavour, with a mild degree of sweetness. When chewed, the pieces become soft, and seem to melt in the mouth.*

The first and second sorts are weighed, and put up into bundles, each weighing 92½ lb. English. Each parcel or bale is firmly bound round with ropes, and then put into double gunnies.

The outside of the bale is marked with the number of the quality of the cinnamon, and the initial letter of the name of the protected plantation from whence it is procured. The bales of cinnamon which are procured in the neglected plantations, the woods of our own territory, or in the Candian country, are marked A. G. (Abandoned Gardens.)

* On an average of 10 years, it appears that about one-sixth of the cinnamon collected has been rejected as unfit to form a part of the Company's investment. The specimens of cinnamon from China which I have seen differ from good Ceylon cinnamon in being darker coloured, rougher, and not so well prepared, denser, and breaks shorter, but without crumbling. It is more pungent, and has a flavour easily distinguishable from Ceylon cinnamon. The taste is harsher; and, when chewed, is more ligneous. Ceylon cinnamon has a delicious sweetness, which is not very perceptible in China cinnamon. Some of the tubes are deficient of the spicy qualities of cinnamon; and sometimes pieces are found which have an astringent and bitter taste.

The company export their cinnamon from Colombo or Galle. The interstices between the bales are filled with black pepper. This mode of packing was generally practised by the Dutch, and has been scrupulously adhered to by the English. Thunberg attributes peculiarly useful qualities to the packing with pepper. Accident and economy of tonnage very probably induced the Dutch to adopt this mode of stowing. The ships belonging to the Dutch East India Company appointed to take in cinnamon arrived at Ceylon often half filled with pepper from the Malabar coast. As the cinnamon bales are nearly circular, a considerable saving of tonnage was effected, by removing the pepper, and strewing it among the bales. When pepper happened not to be readily procured, the spaces between the bales were filled with coffee.

The Dutch were less careful in sorting the cinnamon. Thunberg's ludicrous account of the medical men of the colony being employed for several days together in chewing cinnamon has been orally confirmed by the people who had been employed in this duty. At all the stations where cinnamon was deposited "two Doctors" were appointed to "taste the cinnamon." As the inspectors did not unbind the bundles, they had a very limited opportunity of ascertaining the quality of the cinnamon, and none of detecting the impositions and adulterations of the peelers. With the Dutch the peelers incurred blame, and were frequently punished, when the monthly collection of cinnamon was considered defective in quantity; and for successful industry they sometimes received a small premium; hence it became the interest of the peelers to attempt impositions, to increase the weight of their collections. The same practice is followed by the English.

The Directors of the Dutch East India Company complained frequently, in their communications to the Colonial Government, that the cinnamon sent from Ceylon was coarse, and ill-prepared. Sometimes it was so bad that they did not dare to expose it to sale, lest the credit of the Ceylon cinnamon should suffer; and, to prevent its being employed in adulterating cinnamon of a good quality, they were on some occasions obliged to burn it.

On some occasions the Ceylon Government has directed oil

to be extracted from the cinnamon, whose quality did not permit it to form part of the Company's investment. The process is simple: the bark is grossly powdered, and macerated for two days in sea-water, when both are put into the still. A light oil comes over with the water, and swims upon its surface, and a heavy oil, which sinks to the bottom of the receiver. The light oil separates from the water in a few hours; but the heavy oil continues to precipitate for 10 or 12 days. The heavy oil, which separates first, is about the same colour as the light oil; but the portion which separates last has a browner shade than the supernatant oil. In future distillations the saturated cinnamon-water is advantageously used, added to sea-water, to macerate the cinnamon. 80 lb. of newly-prepared cinnamon yield about $2\frac{1}{2}$ oz. of oil, which floats upon the water, and $5\frac{1}{2}$ of heavy oil. The same quantity of cinnamon, if kept in store for several years, yields about 2 oz. of light oil, and 5 oz. of heavy oil.

The prepared bark of the laurus cinnamomum has received a variety of appellations. It has, however, been chiefly known by the terms cassia and cinnamon. The derivation of neither of these terms is well ascertained. It has been asserted that the term cassia, joined with the Hebrew word khenah (which signifies a pipe), is the original of what has been rendered cinnamon in the 30th chapter of Exodus, and that the word rendered cassia by our translators is kiddah, from khadh, to split or divide longways. We read in Herodotus, that cassia grew in Arabia, but that cinnamon was brought thither by birds from the country where Bacchus was born, that is, India. The term used by Herodotus to specify the last of these substances indicates the cinnamon we now have, for it signifies the rind separated from a plant,* and evidently points out the bark, under which form we still receive this spice.

* Vincent's Periplus of the Erythrean Sea.—The extreme ignorance of the ancients respecting cinnamon may be guessed by the account Herodotus has given of the manner cassia and cinnamon were collected. He tells us that cassia grows in a shallow lake; and that round the borders of this lake there are a number of winged animals resembling bats, which are very strong, and utter the most piercing and dismal cries. The Arabs take great care to defend their eyes from the attacks of these animals, and drive them

Galen was of opinion that cassia and kinnamomum were the produce of different species of plants. He, however, finds great difficulty in marking the distinctions. He says that cinnamon resembles the best cassia; and avows that they are so much alike that it is not an easy matter to distinguish them.

The cinnamon mentioned by Galen appears to have been small shoots or branches, which were sold, wood and bark together; *xylo cassia, cassia lignea.*

The ancients enumerate a variety of sorts of cassia. Some of the terms employed to denominate this spice specify the mart, or port, where it was to be found; some a particular character or quality; the origin and import of others are undetermined. Ten different sorts are mentioned in the Periplus:—1. Mosylitick, from Mossylon, a port to which it was brought. 2. Gisi; small, esteemed the best. 3. Ordinary. 4. Aroma; sweet-scented. 5. Mayla. 6. Molo; both unknown. 7. Sclerotera; hard. 8. Duaka. 9. Kitta. 10. Dacar: all unknown. The two leading species of this spice appear to be the cassia fistula, pipe cinnamon, and cassia lignea, the tender unbarked shoots. Cinnamon, according to Doctor Vincent, is in a number of languages specified by a term which signifies a pipe, or is accompanied with a qualitive bearing this import. Khinemon besem (Hebrew); cassia syrinx (Greek); cassia fistula (Latin). Many of the modern languages omit the substantive, cassia, and specify cinnamon by the conditional adjunct of the ancients. Ca-

away: after this precaution, they collect the cassia. Cinnamon is collected in a still more surprising manner. The Arabs themselves do not know from whence it comes, nor the country which produces it. Some people assert that it grows in the country where Bacchus was born; and their opinion is supported by strongly probable circumstances. They relate that some very large birds collect quantities of the sprigs and small branches of the plant which we call cinnamon, a name we have borrowed from the Phenicians. These birds construct their nests with the cinnamon twigs upon mountains inaccessible to man. To procure the cinnamon twigs, it is asserted that the inhabitants of the country adopt the following artifice. They take the dead carcasses of bullocks, asses, or carrion of any kind, and cut it into large pieces, which they place near to the situation where these birds have constructed their nests. The birds immediately pounce upon this prey, and bear it to their nests, which are not in general strong enough to support this load; the fabric divides; and the pieces of cinnamon fall down, are collected, and eventually exported into foreign countries.

nella (Italian), from canna (Latin), a reed; cannelle (French); kaneel (Dutch); caneel (Danish); canel (Swedish); canela (Spanish); canelle (Portuguese); kanehl (German).

The word cassia is by modern authors used in a variety of senses; but as they do not always define it, or explain the specific nature of the substance they intend to describe, it is often difficult to know in what sense they have adopted the term, or to comprehend the nature of the article concerning which they have been writing.

This makes the subject extremely embarrassing. It is, however, very generally used in one or other of the three following meanings. 1. To denote the prepared bark of the laurus cassia. 2. To specify the cinnamon procured from thick shoots, or large branches, of the cinnamon-tree, employing it as synonymous with the appellation coarse cinnamon. 3. To denominate the produce of the laurus cinnamomum found in various countries, and to distinguish it from the cinnamon produced in Ceylon.

With regard to the first specification, it is sufficient to mention that the laurus cassia, dawul kurundu, has been already described, and the distinction between it and the laurus cinnamomum pointed out. It is never decorticated. As to the second, it is well known that the rejected cinnamon, or third sort of that prepared in Ceylon, has been imported into England, and sold under the denomination of cassia.*

The third specification seems to be founded in a supposition that the laurus cinnamomum found out of Ceylon is not equal to that which is produced in this island.

The cinnamon plant abounds in various parts of the world; and we have the assertion of people apparently well able to judge, that the cinnamon produced in some of these places is equal to the finest prepared in Ceylon.

Cinnamon seems to be confined to the torrid zone; at least

* The true cinnamon, such as we at present receive, is the produce of young shoots of the cinnamon-tree; and that which we call cassia is the prepared bark of old branches of the same kind of trees. Cassia is harder, and more woody, than cinnamon. The ancients made use of this quality of cinnamon bark, but we at present reject it.—(See French Encyclopedia, Art. Cinnamome.)

we have no good authority for supposing that it is found much beyond it. Spielman says it is found in Tartary; and many authors have asserted that it grows in China. Spielman's assertion is not supported by any authority which I have seen; and Sir G. Staunton tells us that, with the exception of the camphor-tree, none of the laurel genus grows in China. Osbeck does not include it in his Flora Sinensis.

Cinnamon abounds on the Malabar coast;* the island of Sumatra, particularly about the Bay of Tapanooly;† Cochin China; Tonquin,‡ where it is an article of royal monopoly; the Sooloo§ Archipelago; Borneo; Timor; the Nicobar and Philippine islands;‖ the island of Floris;** and Tobago.†† It has been cultivated in the Brazils,‡‡ the isles of Bourbon and Mauritius, the Sichelle islands, Gaudaloupe, Jamaica, and the northern Circars,§§ the island of Du Prince‖‖ on the east coast of Africa. The cinnamon plant was introduced into Guaiana, in the year 1772, from the Isle of France; subsequently it was transported into the Antilles. In Guaiana the inhabitants cultivatenit in their gardens, and round their cottages. They prepare cinnamon sufficient for domestic purposes, and transmit a small quantity to France.***

Prior to the year 1790 it was introduced into Cayenne by the French Government at a very great expense, and recommended to be cultivated by the colonists.††† Père Labat is of

* Nieuhoff, Rheede, Dr. Buchanan, &c. &c. &c.

† Marsden's Sumatra, Eschelskroon.

‡ Loureiro Flora Cochin Chinensis, Abbe Rochon's Voyage to Madagascar, &c. &c. Pinkerton.

§ Dalrymple.

‖ Ribeiro's Account of Ceylon, De la Harpe's Collection of Voyages.

** Nieuhoff.

†† Posthlewaite's Commercial Dictionary.

‡‡ Jerome de Merolia's Voyage to Congo; Ribeiro.

§§ Dr. Forster, Dr. Wright, and Dr. Dancer. In 1785 there were 3000 cinnamon-trees of Ceylon in the Isle of France. (See a Report by M. Ceré, the Superintendant of the Botanical Garden.)

‖‖ Les Portugais ont planté quelques cannelliers tirés des Indes Orientales dans l'Isle du Prince, sur la coté d' Afrique, ou ils se trouvent maintenant en abondance, et se sont etendus sur une grande partie de l'isle. (See Laurier, French Encyclopedia.)

*** Memoir by L. C. Richard in the Memoirs of the French Institute.

††† Report by Jussieu and Desfontaines in the same work. Cinnamon

opinion that the bois d'Inde of the French West India Islands is the same species of plant with the laurus cinnamomum.

The etymology of the terms cinnamon and cassia is not very evident. We are informed by Ribeiro that the Portuguese historians derive the first from the Chinese word sin-ha-mama, which is said to mean the foot of a pigeon. This derivation is not satisfactory.

To investigate the origin of a term employed to specify an article of commerce, it is particularly necessary to examine the language of the inhabitants of the countries which produce it, and of the merchants and seamen who trade in the commodity. The consumer very generally adopts the term given to a substance by its cultivator. Sometimes the term employed implies the country of the people who are its importers. It has been asserted that the Chinese were very early and extensive traders in the Indian seas; and Ribeiro, on the authority of the Portuguese historians, states that they imported spices into Ormus, and other ports in the Arabian Gulph. He tells us, also, that the Arabians give the appellation of dar Chini Seylane (the China wood of Ceylon) to the cinnamon produced in Ceylon; while they apply the term kerfah to the cinnamon produced on the coast of Malabar, and other countries.

The Persian appellation for this commodity is dar Chini. The Hindoostannee term for it is dar Chinie. This term might have been applied in consequence of the Chinese importing cinnamon into distant ports; or perhaps, more probably, from merely supplying the merchants with it when they arrived at any of the ports of China. Cinnamon was for a long time imported into Europe under the appellation of China wood.

Herodotus tells us that the term used by him to specify cinnamon was adopted by the Greeks from the Phenicians. Their country, however, did not produce cinnamon; but as they were industrious merchants, and extensive navigators, they may have imported it from the countries where it grew, either in their own ships, or in those of other nations. "Traders from the

has been successfully cultivated in the island of Dominica by a Mr. Buée. The same gentleman has succeeded in propagating the Clove-tree in Dominica.

Arabian coast had probably in all ages frequented the eastern seas, although no record of their voyages of an earlier date than the ninth century has been preserved."*

In Cochin China the cinnamon plant is termed cay quc. The Chinese appear to have adopted this term, but in some degree modified; they call it kuei chau, which, when pronounced by a native of China, sounds like the word qui sheu or qui chou: chou in the Chinese language signifies a tree. That the term employed by the Chinese to specify cinnamon has a foreign derivation, is extremely probable; as it appears that cinnamon is not indigenous in China. It appears very probable that the term cassia has been derived from either the Cochin Chinese or Malay languages.†

The Malays specify cinnamon by the term kayu manis (sweet wood). Marsden renders it kulet manis (sweet bark or rind), which may be the appellation employed by the higher classes. The vulgar, however, term it kayu manis. There is a considerable consonance in the pronunciation of the terms cassia, cay, and kayu, all indicative of the same substance.

The Malays were in early ages an active, enterprizing, and commercial people. Their language is very generally employed in the districts bordering on the sea coasts of the islands of the eastern Archipelago, the Malay peninsula, Sumatra, Java, &c. These countries abound with cinnamon, which the Malays exported probably in their own ships, or furnished the merchants of other countries with it, in the ports of the districts where it is found most abundant. This they now do; and foreigners would very probably adopt the Malay term for

* Marsden's Introduction to a Grammar of the Malay Languages.

† Valentyn derives the term cassia from Cassia, the name of an island in the Persian Gulph, which was for a long period a depot for the productions of India. Here the merchants from Europe found cinnamon, which, according to this author, was by the physicians termed cassia lignea (cassia wood). According to Dodoneus, Galen once saw a branch of a tree, one end of which yielded cinnamon, and the other cassia. The same author informs us that Theophrastus and Pliny confidently believed that cassia and cinnamon were the produce of the same species of plants, and that whatever difference existed between them, they supposed arose from the circumstance of the former being procured from trees which grow on the hills, and the latter from those which grow in the valleys.

the article; and by this means, through a succession of traders, the Phenicians, and eventually the Greeks, may have received the term cassia and cinnamon. Cassia is not improbably a corruption, or foreign pronunciation, of the Malay term kayu (wood), omitting the qualitive adjunct manis (sweet); and the kinamon of the Greeks may be derived from kayu manis, altered by incorrect pronunciation, or erroneous transcription. The vowel *y* in kayu has the power of a consonant, and in this word has a soft nasal sound, resembling in no inconsiderable degree the usual enunciation of the letter *s* in cassia. Orally the Malays frequently confound the sounds of the vowels *o*, *u*, and *a*. They often pronounce the term kayu manis as if it were written kaynomanis or kainamanis, which terms do not differ materially from the ancient kinnamon, or the modern cinnamon, either in the letters, or in the mode of utterance: and they certainly specify the same substance. It is worthy of observation that Moses employs the term sweet (manis) cinnamon.

SELECTED REVIEWS.

A Treatise on the Medicinal Leech, including its Medical and Natural History, with a Description of its Anatomical Structure; also Remarks upon the Diseases, Preservation, and Management of Leeches. By JAMES RAWLINS JOHNSON, M. D. F. L. S. Member Extraordinary of the Royal Medical Society, Edinburgh.

[From the Annals of Medicine snd Surgery, for June, 1816.]

No animal more deserves the attention of medical men than the leech, as it is not only a subject of comparative anatomy and physiology, but a most important remedy; and a wag would add, perhaps,—as it is likewise a namesake.

" The learned *leeches* in despair depart,
" And shake their heads, desponding of their art." DRYDEN.

The present little work is very industriously and carefully written. It is divided into four sections. The first contains the medical history of the leech; the second, the natural history; the third, an account of the anatomical structure; and the fourth, an account of the diseases, preservation, and management of leeches.

We do not find the employment of the leech mentioned before the time of Augustus. Themison highly extols it, and was in the habit of applying cupping-glasses afterwards, to withdraw as much blood as possible. Pliny recommends it in the gout. It has been subsequently never omitted among the remedies of medical writers. The ancients had of course a great many silly errors respecting the leech, but it appears from Pliny that they knew as well as the moderns how to induce it to stick, by puncturing the skin, or by smearing it with blood or milk; and how to extend the utility of a single leech, by snipping off its tail (a practice very lately brought forward as new), so that as the blood dropped away from the wound, the animal, *non missura cutem nisi plena cruoris*, endeavouring in

vain to fill itself, would continue sticking and sucking for a great length of time. If aldermen could bear snipping like leeches!

The natural history of the genus *hirudo* is confused. Some animals are often called leeches, which are not really so nor admitted as such by eminent naturalists. These Dr. Johnson constitutes into a genus entitled *Glossiphonia*, characterized by "a body depressed and rather oval, a pointed head, a tubular tongue, progression by alternately fixing the head and tail." The character given of the genus *hirudo* is "an oblong roundish body, truncated at each extremity, hornless, cartilaginous, progression by dilating alternately the head and tail." Its species are found in the sea, or in rivers and pools. Of the former there are, according to our author, six—the *Hirudo Indica*, *H. Grossa*, *H. Hippoglossa*, *H. Bronchata*, *H. Muricata*, *H. Verrucosa;* of the latter no less than ten—*H. Medicinalis*, *H. Sanguisuga*, *H. Troctina*, *H. Nigra*, *H. Vulgaris*, *H. Tessulata*, *H. Lineata*, *H. Heteroclyta*, *H. Geometra*, *H. Marginata*.

The definition of the *Hirudo Medicinalis* is, "depressed, black, marked above by six yellow lines, with black intermediate arches, and below, ash-coloured, with black spots. Ten eyes, thus arranged. ⁝⁝ Length, three inches. In pools and marshes. Its *head*, when at rest, rather round; during progression, pointed. *Mouth* changeable in figure, with generally a triangular opening; *Tail* circular, flattened, with fleshy fibres diverging from the centre."

The horse-leech, *H. Sanguisuga*, "is long, of a greenish brown, below of a greenish ash colour, with black spots."

The leech so much employed lately in the deficiency of the common leech, Dr. J. calls *H. Troctina*, from resembling the trout in its coloured rings or spots, and from being usually known by the name of trout-leech. It is "long and brown, above has golden rings surrounding black spots, its lateral margin rather yellow, and below is of a greenish yellow, with black spots."

The medical leech is common throughout Europe, but more in the south than in the north; and from the draining and cultivation of so many waste lands, we are indebted chiefly

to the Continent, and especially Bourdeaux and Lisbon, for our supply. It is said, that we use at least a hundred foreign leeches to one of our own.

The predominant colour, or ground of leeches depends, like that of the toad, very much upon the soil in which they are found.

Leeches swim like eels, but on a solid surface they proceed backward or forwards, by alternately fixing the sucker at the head and tail, and alternately contracting their longitudinal and circular muscles; the former of which draw the body towards the point of attachment, and the latter extends the body from it.

In winter they inhabit deep water, in summer the shallows. In very severe or dry weather, they retire to a great depth in the earth, leaving an aperture leading to their habitation. When the water is agitated, they retire from the sight, and before thunder they usually come up to the surface, and leech-gatherers take this opportunity for catching them. That they are very much affected by the weather is indisputable. Cowper extols the leech as his best barometer.

The food of the medical leech is said to be worms, the larvæ of aquatic insects, &c. This Dr. Johnson allows to be true in regard to the horse-leech; but he maintains, from his own observations, that the medicinal and trout-leeches subsist by feeding on the fluids of fish, frogs, &c.

"Having procured a frog, I placed it in a vessel containing half a dozen leeches (*H. Medicinalis* and *H. Troctina*), in which floated a piece of deal. The poor animal finding itself surrounded, made every effort, but ineffectually, to reach the upper part of the float, while its enemies pursued it with more than common activity. At length, one of the leeches settled on the back, and the others affixed themselves to the legs. On the following morning the frog was found dead, presenting, on different parts of its body, no less than eighteen wounds, all bearing the usual triangular appearance.

Being in possession of a common water lizard (*Lacerta Palustris*), I placed it in a vessel with four medicinal leeches. The leeches swam about unconcerned, and the lizard was removed in the course of a few hours, untouched. This indifference on the part of the leeches, I attributed to their late

feast upon the frog. Four days afterwards, I replaced the lizard, which had then lost some of its activity, in its former situation, and had scarcely time to cover the vessel, before two of the leeches began the attack by wreathing themselves around their prey, for the purpose of securing a firm hold. In a few minutes, a wound was inflicted. The lizard, hitherto motionless, now struggled violently to release itself. This struggle was continued at intervals, but without effect, for about half an hour, when the lizard yielded to its fate.

"I have frequently placed the common earth-worm (*Lumbricus terrestris*) in vessels with medicinal leeches, but never found it to receive the slightest injury; which is the more singular, as the earth-worm contains red blood, a fluid for which the leech shows great partiality. I have also presented to them different kinds of aquatic larvæ, but never observed the least disposition on their part to injure them. So far otherwise, that I have often witnessed the larvæ of the larger water beetle (*Dytiscus Marginalis*) in the act of seizing the leeches by means of their mandibles. Hence it is sufficiently manifest, that neither the earth-worm, nor the larvæ of aquatic insects, constitute their food."

Dr. J. made analogous experiments with the horse-leech, and found it excessively voracious and fond of solid food, which it very quickly digested; as, indeed, might be expected, from its intestine being double the width of the intestine of the medicinal or trout-leech, and its stomach being not so thickly set with membranous folds.

"I procured a large-sized medicinal leech, gorged with blood, and presented it to about thirty horse-leeches. As soon as the medicinal leech saw the others in motion, it endeavoured to avoid them by swimming to the surface. It was, however, in a little time seized upon, and dragged to the bottom of the vessel. In a few minutes, the water had assumed a bloody tinge, and the leech was quickly deprived of life. To ascertain whether the medicinal leech was destroyed merely from the natural ferocity of its enemy, or to serve as food, I repeated the experiment, taking care previously to feed the horse-leeches with earth-worms. This done, I presented to them two medicinal leeches, which immediately swam to the sur-

face, and attached themselves to the upper part of the vessel, in order to avoid their enemies. This effort, however, might have been spared, for the *H. Sanguisugæ* did not make the slightest attempt to molest, or in any way to injure them; it is therefore evident, that they are destroyed solely for food.

"I counted, in a glass vessel in which they were contained, sixty-five horse-leeches. Five days afterward, I found the number reduced to fifty-two. No less, therefore, than thirteen had, in the short space of five days, been destroyed; not even a vestige was left to denote their former existence.

"Two of the common rivulet leeches (*H. Vulgaris*) were presented to a horse-leech. In a short time, I observed the head of one of the former in the mouth of the latter, who, by the force of suction alone, drew the whole animal into its stomach. This operation took up a quarter of an hour. Its gluttony, however, was not satiated until it had swallowed the other. Three days afterward, one of these leeches was thrown up *in a living state*, appearing to have suffered but little injury from its confinement, and was, after the lapse of a few hours, again swallowed.

"Desirous to ascertain how many of the smaller leeches would be swallowed in a given time, I kept two horse-leeches in separate vessels for a month, supplying them constantly with the *H. Vulgaris*, both in its dead and living state. During the whole of this period, I must observe the water was turbid, notwithstanding its occasional renewal, from the vast disengagement of fæcal matter, which floated about, having a thread-like appearance."

The one leech swallowed from June 10 to July 9, fifteen; the other, twenty.

"On the 15th of June, three *H. Sanguisugæ* swallowed three *H. Vulgares*. On the 20th, I opened the three, and could not, in two, trace the least vestige of a leech. In the third, I found a leech about half digested, surrounded by a fluid, in colour of a deep brown. The intestine in the others was filled with a similar fluid, but much thicker in point of consistence."

Leeches have been said to possess great powers of reproduction. Dr. Shaw made experiments upon the smaller leeches,

the *H. Stagnalis*, *H. Complanata*, and *H. Octoculata*, in 1773, of which he says (Linn. Trans. vol. i. p. 95):

"These animals were divided in every possible direction; and the divided parts, after reproduction, were again subdivided, and again reproduced, without the failure of one single instance."

These experiments Dr. J. repeated, but in every instance failed. When only the head, or the head and tail, were removed, there was not the least tendency to reproduction.

As to the propagation of he leech, two friends of Dr. J. have witnessed them celebrating the deed of kind. The copulation was, like that of snails, double.

They seldom multiply in confinement; in this particular resembling ants and bees, of the latter of which, the elder Huber tells us, that the queen bee never becomes pregnant in the hive, though surrounded by males; but that if she is allowed to escape, she mounts high in the air, and there celebrates the nuptial rites; and the females of the former are obliged to leave the ant hill previously to fecundation, after which, they return, and remain at home solely occupied in depositing their eggs, during which time, the younger Huber discovered that they destroy their wings, which are then only an incumbrance.

Some have contended that the medicinal leech was oviparous; others, that it was viviparous. Now some species of the plant-louse are both viviparous and oviparous, as Trembley, Bonnet, Reaumur, Lyonnet, Mr. Curtis, and Dr. W. Richardson, have established beyond doubt. The same is the case with the wood-louse (*oniscus asellus*); and, according to Redi, with some flies. Dr. Richardson found, that the mode of production in the plant-louse depended wholly on external circumstances, accordingly as these are favourable to life or not: hence, in autumn, eggs are laid, which hatch in the spring, and singularly enough produce females only, but all impregnated, for one copulation is known to be sufficient for nine generations; and in the spring and summer, the young are born alive, begetting, during the season, five generations. Spallanzani found the animalcules of infusions oviparous and viviparous, besides their multiplication by longitudinal, transverse, and

quadruple divisions of their bodies, detachment of certain parts, &c. Leeches *may*, therefore, be oviparous and viviparous. There is authority on both sides, but greater, undoubtedly, in favour of their being oviparous, to which opinion our author assents.

The leech is very tenacious of life. It will not only live, as was mentioned above, after the removal of its head and tail, but for many days in an exhausted receiver, and in distilled water. Dr. J. found them to live in a glass vessel, containing

3 cubic inches of hydrogen gas . . .	2 days,	12 hours.
carbonic acid . . .	0	5
nitrogen	8	0
atmospheric air . .	10	0
oxygen gas . . .	12	0
water, strongly impregnated with Carbonic acid gas	0	4
olive oil	1	16
spring water, the vessel being well corked . . .	7	0

Bibiena found them recover after suffering contraction, from being placed in a vessel surrounded by snow; but they died when frozen by the more intense cold of a mixture of salt and snow.

Leeches have been known to live in confinement, when full grown, eight years; and as they grow very slowly, Dr. J. conceives they may live in natural situations, at least twenty years. Whether this is not too long a period to assign to their life, we cannot say.

In treating of the anatomy of the leech, the external structure is first considered, then the organs of sense, afterwards the respiratory organs, and, finally, the internal structure, which is very remarkable.

The body of the leech is composed of a number of rings, or annular muscles, which, with use, grow in size, but not in number, as hitherto has been supposed.

1. The mouth, or rather, portion formed by the upper and

under lips, is of a circular or horse-shoe form, and acts, when attached to any substance, as a sucker, by means of the muscular apparatus at the upper part of the œsophagus. There is another sucker at the posterior extremity.

There are two openings in the belly. The one termed generative, round and small, placed about an inch and a half from the lower lip, and containing the penis in a sheath. The other a quarter of an inch behind the first, extremely small, termed vagina, and leading to the uterus.

There is a third foramen in the back, a little above the rim of the posterior sucker. It is the anus.

2. The eyes are ten in number, ranged in a crescent form at the pointed extremity on the back of the head. Touch probably resides in the margins of the suckers. Taste at the upper part of the œsophagus. Hearing, we discover no organ of. Smell Dr. J. imagines to reside at the breathing holes.

3. Some naturalists regard the leech as breathing by the mouth, others by *puncta respiratoria*.

Although leeches live some time when immersed in oil, earth worms, which are known to breathe by *spiracula*, do the same; and Dr. J. found a leech live as long after a string had been tightly drawn around its head, as when immersed in oil.

4. As to the internal structure, they have an epidermis, cutis, muscular coat, and membranous coat, with intervening cellular substance. The epidermis is cast every four or five days. The fibres of the muscular coat are both longitudinal and circular. The membranous coat lines the whole internal cavity.

The pincers are three in number, rounded, cartilaginous, have sharp edges, resting on small eminences, and meet in the centre under equal angles. Poupart thought the wound was produced simply by suction, but Dr. J. has found the pincers, which become stiff at the time, buried in the wound, on lifting up the sucker with a pen-knife. He says, they are moved backwards and forwards, gradually making the wound; during action, they are in constant oblique motion from side to side.

Around the œsophagus is a nervous ganglion, which distributes filaments to different parts of the body.

The blood-vessels have red contents. What has been considered as a nerve, Dr. J. has found to be really a blood-vessel,

which he denominates the abdominal vessel. It proceeds in a straight line from the mouth to the tail, expanding into a diamond form in several points of its course. There are also two lateral blood-vessels, and one dorsal, all four anastomosing by irregularly distributed transverse branches. These Dr. J. has seen pulsating, but could never discover, like Durandeau, any thing like a heart.

The leech is hermaphrodite, but whether capable of self-impregnation, is unknown. Besides testes, and uterus, and ovaria, there are many abdominal vesicles, containing a fluid like that of the testes. The lateral vesicles are about thirty in number, and usually regarded as organs of respiration; but as far as our author has remarked, they merely secrete that unctuous matter with which the body is covered, preventing it from being easily seized, and preserving the pliability and elasticity of the rings.

The œsophagus is about a quarter of an inch in length. The cells or stomachs, are from eighteen to twenty-four, and run along four-fifths of the body. The alimentary canal runs between the rows of stomachs, and the intestine beginning from the posterior edge of the opening to the last cell, is about an inch in length, has a valve at its anterior part, to prevent the regurgitation of the fæces, and a sphincter to prevent the escape of a plenteous repast.

In some parts, persons occupy themselves solely in furnishing and applying leeches. The leeches are thus afforded at least as cheap as from the shops, and the animals being properly taken care of afterwards by the persons to whom they belong, do not suffer that prodigious destruction which occurs in London. We wish heartily with Dr. J. that this custom was as general as possible. If leeches are kept out of water an hour at least before application, they are rendered much more voracious. If they adhere to a wrong part, they may be removed by inserting the nail between the mouth and the patient's surface. They fill in about ten or fifteen minutes, and often adhere indolently, but may be roused by sprinkling them with cold water. Snipping their tails while sucking, makes them suck for a longer period; but it renders the leech some

time afterwards extremely languid. The best mode of making a leech disgorge, Dr. J. says, is, to pour a little vinegar upon its head.

Leeches are liable, especially in hot weather, to ulcers, constrictions, and flaccidity. A healthy leech is firm in the hand.

Such is this work, which reflects great credit upon its author.

MEDICAL JURISPRUDENCE. *Foderé Médecine légale*, 8*vo*. 6 *vols*. *Paris*, 1813.

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OUR attention has been directed to the science of Medical Jurisprudence or *State Medicine*, as it is termed in Germany, by some recent publications of considerable merit. As a science it is not known in this country, nor does it form any part of the necessary studies of the medical practitioner. In the present Paper, we shall point out what we consider to be its leading branches; and we are so convinced of the benefit which would result to mankind from a more general attention to this science, that we shall not apologize for having entered on a subject which may probably be considered not to be immediately within the limits of our journal. The science of Medical Jurisprudence comprehends the evidence and opinions necessary to be given in courts of justice, by practitioners, on all subjects relating to their profession: according to the English laws, the testimony or the opinions of medical men are not directly required, though it is usual in certain cases, to require their evidence on professional subjects: public attention has been of late called to the laws now in force relating to coroner's inquests, and the mode in which they are administered. This subject is intimately connected with Medical Jurisprudence. Without wishing to discuss the propriety of the laws for the punishment of suicide, so far as they relate to the forfeiture of property, and the giving publicity to the offence; there can be little question but that the exposure of the body of the suicide is not consonant to the

feelings of the present age: and yet it cannot be forgotten, that within a short period the body of an unfortunate wretch was, in open day, dragged in procession along the public way, headed by the civil power. Very slight evidence, or rather no evidence at all, but merely the discretion of the coroner, is sufficient to procure a verdict of lunacy; and that such verdicts are often corruptly procured, no person who has attended to the proceedings of coroners inquests, can have any doubt. It may be questioned whether an ignominious burial has any direct tendency to the prevention of suicide; and unless it is clearly established that it has, in an enlightened age, like the present, so barbarous and disgusting a law should be abolished, or at least why should not the very fact of suicide be considered in *all* cases, as affording evidence of insanity? It is of the utmost importance to the due administration of justice that the evidence before the coroner should be complete and correct. To insure this, it will be requisite that enactments should be made, at once regulating the mode of producing such evidence, and the class of persons by whom it is to be given. Several instances of the grossest neglect and irregularity in the evidence of medical persons have come to our knowledge; the following is one of the most flagrant:—a servant had died in consequence of poison; it was supposed she had taken it purposely, though she stated that it was taken by her as a dose of salts which had been carelessly left about by another servant: there was, however, reason to suspect that she had been pregnant, and had lately miscarried. The prejudice was considerably excited in favour of the deceased having taken the poison accidentally. Two medical gentlemen of eminence attended to examine the body; the apothecary who was to give evidence before the coroner, was also in attendance; and as, from the early part of the examination, there was little question but that the woman had been pregnant, on the examination proceeding, the apothecary actually left the room, stating, that as he was to be examined before the coroner, if he gave any evidence which might seem prejudicial to the character of the deceased, it would seriously affect his professional interests in the neighbourhood! Now, in this case, independently of false evidence hav-

ing been in fact given before the coroner, injustice was done to the servant who was supposed to have brought the poison into the house. In order to insure proper attention and skill on the part of medical persons who may be called in to give their evidence before coroners, we should propose, that in addition to the usual course of education, all medical students should be required to attend a certain number of lectures exclusively on the subject of Medical Jurisprudence, in which their attention would be particularly called to those parts of the science of medicine, respecting which they would be liable to be called upon to give their opinions, in courts of justice, with peculiar directions as to the nature of the proof required, and the effect of their testimony. In addition to this, we conceive much benefit would arise from the prescribing particular rules to be adopted in all cases of sudden or suspicious death; and making it imperative on the coroner to employ particular medical persons (who should be remunerated;) and for this purpose a certain number of practitioners in each county, who had previously passed such examination as might be thought fit, should be named as the persons to be employed by the coroner; and that every such examination should be made according to certain directions to be determined on, and a report of it in writing signed and sworn to by the person making it. In order to facilitate the mode of making these examinations and reports, certain printed formulæ might be devised, stating the mode of examination to be pursued, and the results; such formulæ, of course, to be varied according to circumstances. This is the mode adopted in France, and in other countries in Europe, and from the adoption of which we conceive much benefit would arise. The reporter might still be examined *vivâ voce*, either before the coroner, or on the trial. Independent of the improvement which would result from this, in the administration of justice, much good would arise from the removal of doubt and suspicion in the public, which is often misled by the evidence given before coroners, on medical subjects, owing to the unfitness of the persons employed. There can be little question, that had the examinations and analysis been skilfully made, no public disturbance or discontent would have arisen in the case of Elizabeth Fenning, who

was executed for an attempt to poison the family of a stationer, in Chancery-lane.

The evidence of medical men, amongst lawyers, is a subject of general animadversion; and indeed it is impossible to refer to the several printed trials, such as those of Spencer, Cowper, Donellan, and others, without astonishment at the inconsistency and uncertainty which seems to have pervaded the opinions of former medical practitioners.

It may also be expected, that much good will result from the canvassing the points necessary to be attended to, in examinations of the nature we have mentioned, and that greater skill will be attained, and important discoveries made, in the application of remedies in cases of suspended animation, the administration of poison, &c., respecting which, little attention seems to have been paid by the generality of the present practitioners, at least those of the second class; and it is amongst the second class that skill and knowledge in this branch of science is particularly required, as they are most frequently called upon in cases of poison, &c.

The first directions respecting the consulting medical men, in the administration of justice, in any modern code, is in the Constitutio Criminalis Carolina, of Charles V. which enacts, that the evidence of medical men shall be taken in cases of violent death, poison, child murder, &c.; and now by the laws of most of the States in the Continent of Europe, their evidence is required in similar cases. The code Napoleon, one of the most singular productions of modern Jurisprudence, gives, at considerable length, the rules to be observed in making the necessary reports, and in the testimony on medical subjects connected with Jurisprudence.

The most distinguished works on this science, amongst the Germans, are, the Pandectæ Medico-legales, of Valentini, 1702; the works of Plenk, Frank, and Sikora, together with the Colatio Opusculorum Selectorum ad Medicinam Forensem spectantium: curante Schlegel, 1787.

Amongst the Italians, Paul Zacchias is most distinguished. Ambrose Paré was the first in France who treated on this subject; and the Médecine légale et Police médicale, of M. Mahon; "the Course of Legal Medicine," of M. Belloc; the

Médecine légale of M. Foderé, and the toxicology of M. Orfila, are amongst the most eminent of the modern French works on the subject. In this country, with the exception of the Lectures of Dr. Duncan, of Edinburgh (where there is a professorship for the study of Medical Jurisprudence) we have no publication of any note, although there are several Essays, on particular subjects relating to Medical Jurisprudence, of considerable value. Amongst the foremost, is to be reckoned the Paper of Dr. W. Hunter, on the uncertainty of the signs of murder in bastard children.

We shall conclude our remarks on this subject, with a concise enumeration of the subjects embraced by the science of Medical Jurisprudence, which we shall notice in the order in which they are treated of in the work of M. Foderé, which, though very prolix, and written without either great professional skill or talent, contains much curious information on the science, as well as the opinions of most of the preceding writers on the subjects discussed.

The *physical qualities* of man, form one of the first and most important subjects of enquiry. According to the laws of all civilized nations, there are certain fixed epochs when reason is to be considered as sufficiently developed for the exercise of certain acts; such as the dominion over property—union of sexes—holding of offices, &c.—Majority is to be considered a civil institution, varying in different nations and climates. In the debates on the code Napoleon, no point was more discussed, than, whether the period of majority should be fixed at 21 or 25; but the former was determined on, except in the case of power to contract marriage, and the discharge of some particular functions. Many cases may arise, and have arisen in this country, in which the age of a party is only to be ascertained by presumption, and it is obvious, that the opinion of medical men on this subject, must have considerable weight. A considerable portion of the first volume of M. Foderé's work, is taken up in discussing the physical powers of man, at different ages, as far as regards his legal capacities—the commission of crime, and infliction of injury. The Médecine légale of M. Foderé contains a very detailed commentary on the code Napoleon, which, like many other

codes, attempts to establish a scale of the physical powers of man, by which their faculties and incapacities are to be ascertained. Zacchias, one of the most sensible writers who have considered this subject, which it seems, has (fruitlessly enough, in our opinion,) occupied the attention of many jurists and medical writers, admits that the legal period of age must arise from arbitrary presumption, rather than from any rules resulting from observation of nature, whose variations are infinite.

Many important points arise on the question when the period of gestation ceases: from 45 to 50 is the ordinary time, though there are exceptions. This point was much canvassed in the Douglas cause. Haller, speaking upon this subject, mentions many women who have borne long after 50, and who, it may be said, experienced a sort of second youth— have borne, as he states, up to 70. The English law admits of no presumption, as to the time when a women ceases to have children, though this enters into most other codes. In England, property, which reverts to the parents, in default of issue, is frequently tied up till after their death, though the moral probability of their having issue may long have ceased.—Many curious points seem to have arisen in France and other countries, with respect to identity; and the subject, in all the treatises, is noticed at considerable length.

The next point is, the relative and absolute duration of life. In case of absence, the English law admits of great latitude; and as each particular instance is determined by a jury there is very little certainty as yet established ; great practical convenience, however, would result from fixed rules on this subject.—The relative mortality of the sexes is also considered, at length, by M. Foderé.

The presumption of survivorship, amongst persons perishing by the same mischance, as shipwreck, suffocation, &c. when no positive evidence can be procured, as to the exact periods of their death, is also another point of which the foreign jurists have written much, but respecting which, we have no positive rules in this country. It frequently becomes a question of considerable importance, in the devolution of property, to ascertain which of two persons survived; as parent or child, testator or legatee, &c. The laws of several na-

tions have admitted of arguments, drawn from the relative supposed physical powers of the parties to sustain life, such as are to be inferred from the difference of age, sex, &c.

In imitation of the civil law-codes, the code Napoleon has attempted to lay down particular rules for the devolution of property, in cases of this nature: we extract the following passages:—" persons dying, who are the legal representatives to each other, without it being known which died first, the presumption of survivorship is to be determined by the circumstances of the case, and in default thereof, by the strength, age, and sex of the parties. If those who shall so die together, shall be both-under 16, then the *eldest* shall be presumed to have survived; if they were all above 60, then the *youngest* shall be presumed to have survived; if some under 15, and others above 60, then the first shall be presumed to have survived; if all are above 15, and under 60, then the male is presumed to have survived, if the ages are equal, or the difference does not exceed a year; if they were of the same sex, then the presumption of survivorship, according to the order of nature, is to be adopted, and the younger is supposed to have survived the elder." In this there is an odd mixture of arbitrary rules, and an attempt at reaching the probable truth, by a comparative estimate of the physical powers of man; besides, many objections might be made to the above rules; as far as they attempt to regulate *on principle*, the doctrine of presumptions, we conceive, that the simplest law, and the one that would most probably come nearest to natural justice, would be to enact, that in all cases, the order of nature should be presumed to have taken place, and therefore, if father and child died, whatever their probable physical powers, the child should, as in the course of nature, be considered as having survived the father; and so in all cases of succession. The English law, on this subject, is entirely defective, and although there have been questions in which it was necessary to decide which was the survivor, in the absence of all but presumptive evidence, it does not appear that any decision was ever made, or that any principle of law was admitted, either original, or as adopted from the civil code; whereas, if some fixed rule were adopted, parties at least would not be ignorant of the na-

ture of their rights. In a cause lately before the Court of Chancery, which was the case of a legatee and testator being shipwrecked in the same ship, it was sent by the Master of the Rolls to be tried by a jury *which survived*, though he admitted there was a *total absence of all evidence*, on which they could found their verdict; whereas, had some principles with regard to legatees and testator dying, been adopted, no question could have arisen. Notwithstanding the manifest fallacy of all reasoning tending to prove who was the survivor from the relative physical faculties of the deceased, it seems to have been a frequent subject of speculation amongst the writers on Medical Jurisprudence; and a very considerable part of the second volume of Foderé's work, is devoted to the consideration of the modes of ascertaining the probable survivor, in cases of death, by shipwreck, fire, cold, suffocations, &c.

The consideration and study of the different defects of the mind, form an important branch of the study of Medical Jurisprudence. Pinel has divided the diseases of the mind into four clases;—*mania*, or general delirium; *melancholia*, or exclusive delirium; *dementia*, or obliteration of thought, and *idiotism*, or abolition of the intellectual faculties. But the diseases of the mind are so varied, that it is difficult, with certainty, to class symptoms admitting of such infinite variety; however, questions at once involving life and property, are frequently dependent on the judgment and the evidence of the practitioner. From insanity are to be distinguished hysterical affections, the effects of depraved instincts, jealousy and inebriety, excesses arising from sudden accessions of peculiar passions of the mind, and temporary alienations of reason arising from disease. In considering the faculties of man, many curious questions arise on the moral and physical powers of those who are born deaf and dumb, as to their capacity of performing the different functions of life, and how far they are amenable to punishment for the commission of crimes. In this country, these are questions on which a jury alone decide. Another question, in which the testimony of medical men is of considerable importance, is the consideration how far persons affected by disease, executing a will, are to be considered

in a situation to judge of the propriety of the act executed by them.

Of Marriage.—Few, if any, questions are now likely to arise in England, relating to the *time* and *capacity* of parties to marry. The subject of marriage involves that of *impotence*, which may be divided into absolute and perpetual, relative and accidental, or temporary, curable and incurable.

Pregnancy.—No one part of legal medicine involves so many important questions, as *conception* and *childbirth*; and none are more entangled with difficulties. These points, from their importance, call for the greatest care and circumspection. The signs of conception are divided into rational, particular, and sensible; and notwithstanding the advancement of science, the knowledge both of the one and the other of these signs, is sometimes involved in great difficulty, and frequent errors occur, in the judgment of the most experienced practitioners, even when women have no motive for concealment. The question of superfœtation, has given rise to much learned discussion: M. Foderé sides with Buffon, Haller, and the other advocates for it—and thinks it is of rare occurence, but not impossible. A case of a woman who had twins, one white and the other black, is mentioned by Buffon.

The symptoms of delivery, and how far they are to be distinguished from all other uterine excretions, form another important topic; as also the period of time after delivery, when the symptoms may be ascertained with certainty.—The capacity of women in labour to render proper assistance to the fœtus, so as to preserve life.—The determining whether the fœtus died before, or after delivery—upon this point much difference of opinion exists, and it is deserving of considerable attention, in order to enable the practitioner to do justice in giving his opinion.

Utero-gestation.—The next object of discussion, is the period of utero-gestation. In all other animals, the period of utero-gestation is very constant. Haller states, that the time of going with young is very regular in animals, but that it is not so regular in women. He gives references by which we read of a woman going ten, eleven, twelve, thirteen, and even fourteen months. Hippocrates says, that, " he can allow the

possibility of a child being born at ten months, but not later." The former system of France allowed ten months. By the code Napoleon, the legitimacy of a child born 300 days after the dissolution of the marriage, may be questioned.

Dr. Clarke, in his Lectures, published under the title of London Practice of Midwifery, treats the possibility of the periods extending beyond the forty weeks with ridicule, though contrary to the opinion of many very distinguished practitioners, and indeed, as some have conceived, contrary to reason; for as the fœtus receives its nourishment from the mother, the probability is, that any very material alteration in her constitution, may cause the retardation, of the maturity of the infant. Besides, the fact of irregularity, in the time of utero-gestation, has been satisfactorily established, in the case of animals, when no motive for prejudice or concealment can arise. With regard to the legitimacy of children born in wedlock, only two reasons are allowed against the legitimacy of the child by the code Napoleon; viz. absence of the husband, or his being affected by some disease, by which it is to be inferred, it is impossible he should be the father of the child. Non-access is the only ground of disputing the legitimacy in England; but the rule of evidence in this respect has been of late very materially altered, by the opinions of the judges in the Banbury peerage, who have, it is conceived, introduced an *anomalous* division respecting the evidence of access, dividing it into *access*, and *generative access*; so that if this distinction be hereafter recognised, much uncertainty may be introduced respecting the title and succession to property, and a new and difficult subject will demand the attention of the medical student.

In discussing the time when the fœtus may be supposed to be perfect, the faculty of Leipsic, with great complaisance, determined that a child, born five months and eight days after the return of the husband, might be considered as legitimate, and that children at five months, were often perfect and healthy. *Valentini*, who reports this decision, is also gallant enough to concur in it.

By the English laws, an husband is entitled to a life interest in the estate of his wife, if he have a child born alive; and

the expression of the old law is, if the child should be heard to cry. Some cases, where children have been born alive, but have not uttered any cry, though they have breathed for a continued period, have caused much learned discussion; and a case in 1806, in the Exchequer, (where the lips of an infant had moved after birth, but no cry was heard,) gave rise to much curious evidence, particularly by Dr. Denman, who was of opinion, that the motion of the lips immediately after birth, was not a decisive proof of the presence of the vital principle, and distinguished between *uterine* and *exterior* life, the latter being called into action by the operation of the air on the lungs. Each case of this nature in England is determined by a jury, on its particular circumstances: according to the civil code, *idem est non nasci, et non posse vivere.*

Till the relaxation of the severity of the laws in this country relating to infanticide, many unfortunate mothers suffered death for crimes they never committed. Prejudice on the part of the juries, and ignorance on that of the practitioners, seem to have conspired to destroy the wretched mother. Dr. William Hunter, in his able paper on Infanticide, was one of the first who had the credit of turning the public attention to this subject. No one has written more eloquently in favour of the female character; and from the opportunities of observation, which his extensive practice afforded him, there is no one whose opinion is entitled to higher respect. Even now, however, it may be doubted, whether there are not some who suffer unjustly, when the incapacity of the mother to assist her infant in a concealed delivery, the probable accidents arising from position, fainting, and delirium, are considered: the horror excited by the idea of a mother's murdering her offspring, may still prevent mankind from judging of the case of the infanticide with impartiality; added to this, the natural appearances have not unfrequently been attributed to violence; and a case has been noticed as having occurred a few years ago, where the sutures and fontenelle were mistaken by an ignorant practitioner, for fractures of the skull. That to form an opinion, which is to decide the fate of a fellow being, on a subject so difficult, and presenting so extensive a field for observation, requires the narrowest scrutiny and attention, need not be no-

ticed; and the probable improvements in our skill respecting these matters, may be easily imagined, when it is considered, how short time since, the lungs, swimming in water, was considered as decisive evidence that the fœtus had inspired air, and which is now admitted to afford, at best, but a very uncertain criterion of the existence of extra-uterine vitality.

The cases of monstrous births have seldom given rise to legal discussion in this country, though the works of foreign writers abound with descriptions of them.

The next class of cases which occur, are, the appearances of death in bodies, and whether the death was natural or violent, as in the case of strangulation, suffocation, drowning, &c. from blows and wounds, &c. and the determining whether particular wounds are to be considered as mortal; after these, come rape, and feigned diseases, the most frequent of which are, epilepsy, insanity, ulcers, and blindness, &c.

Remarks on Arsenic, considered as a Poison and a Medicine; to which are added, five cases of recovery from the poisonous effects of arsenic. Together with the tests so successfully employed for detecting the white metallic oxide; in which those satisfactory methods, peculiar to Mr. Hume, were principally adopted, confirmed, and compared with others formerly in use. By JOHN MARSHALL, Member of the Royal College of Surgeons in London, and Apothecary to his Royal Highness the Duke of Gloucester's Household, &c. &c.

[From the Edinburgh Medical and Surgical Journal, for October, 1817.]

MR. TURNER, Mr. Robert T. and Mrs. R. T. in the 7th month of pregnancy, partook at dinner, on Tuesday, March 21, 1815, about 4 P. M., of some yeast dumplings. Mr. R. Turner ate a dumpling and a half. They seem not to have been sensible of any thing unusual in the dumplings, but soon became ill. We are told, that, at the commencement of the operation of the arsenic on Mr. R. T. his father was alarmed at the alteration in his appearance; the countenance was of a

complete yellow cast, and the features altered and contracted, so as to resemble an aged man. Soon after dinner, a medical gentleman, Mr. Ogilvy, was sent for, who administered to each of them a full dose of castor oil, and gave sugar and water plentifully, occasionally mixed with milk. We are not informed when the cook-maid, Eliza Fenning, became ill, or whether she had eaten of the yeast dumplings.

Mr. Gadsden, Mr. Turner's apprentice, dined on beefsteak-pye at two o'clock. About an hour and a half after finishing his dinner, he ate about the size of a walnut only of the remains of the yeast dumplings, and would have eaten more, but was forbid by the cook-maid. In almost an hour and a half, he became sick, and vomited twice, then felt quite well, and went, on foot, for Mrs. Turner senior, from Chancery-Lane to Vauxhall, a distance of three or four miles: and not until he arrived there was he in the least aware of being poisoned; but he then became seriously ill, with an excruciating pain and a burning heat in the stomach, and felt so much alarmed, that he thought he would have died. As soon as seated in the coach to return, he began to vomit, and continued to do so, almost without intermission, the whole of the way home.

About half past eight, the patients were seen by Mr. Marshall, who thus describes the state in which he found them:

"On entering the house I first saw Eliza Fenning, the cook, lying on the stairs, apparently in great agony, and complaining of a burning pain in the stomach, with violent reaching, headach, and great thirst. I directed her to drink some milk and water, and to be immediately conveyed to her bed; at the same time observing, that I would see her again as soon as possible, after having visited the rest of the family, who, I was then informed in the most anxious manner, by Mrs. Turner senior, 'were all four of them much worse than the cook.' My attention was then directed to Mr. Robert Turner, who appeared to be nearly *in articulo mortis;* his face, which had been swollen, having assumed the appearance of the true *facies hippocratica*, my apprehensions were considerable for his preservation. On examining the contents of the utensils in which he had vomited, a fluid was perceived of a yellowish and greenish colour, and in two of them stercoraceous matter; the pulse was

gone, his voice faint and tremulous, and he pointed to the abdomen in great agony. On examination, I discovered a very remarkable irregularity of surface, occasioned by the spasmodic contractions of the muscles of the abdomen, and even of the viscera; this unevenness extended from the epigastric region to the *pubis*, and to the right and left *hypochondrium;* and the excruciating pain was relieved, for a short time, by rubbing the abdomen with a piece of hot flannel and laudanum."——

"He complained of extreme faintness and dreadful sickness. Mr. R. T. had been violently purged; and, on examining the alvine secretions, the singularity of their appearance excited great surprise; they were all of a bright homogeneous green colour, like paint, and strongly resembled the green colour produced from a solution of the arsenic by one of Mr. Hume's tests, the ammoniaco-sulphate of copper, which will afterwards be more fully described. Each effort of vomiting and purging was preceded and followed by these painful gripings and spasmodic contractions of the abdominal muscles. Mr. R. T. complained of great heat in the stomach, which the patient compared to a furnace, or red hot irons; which sensation commenced at the tongue, and was felt throughout the course of the *œsophagus* to the *cardia*, or upper orifice of the stomach; insatiable thirst, violent headach, the eyes impatient of light, but the pupils sensible, and the extremities cold. The patient attempted, in this dreadful state, to get out of the bed, to walk to the night table; he was directly seized with vertigo, dimness of sight, and palpitation of the heart; he fell down, and went off into an epileptic fit; he was assisted on the bed, and in a few minutes recovered from the fit.

"Mrs. Robert Turner had great pain and burning heat in the stomach, headach, immoderate thirst, vomiting and purging, with olive green alvine discharges, tension of the abdomen, the face swollen, cold chills alternating with flushings of heat; and light was painful to the eyes. Mrs. R. Turner's peculiar situation made me apprehensive of a miscarriage, in consequence of frequent bearing pains more or less constant in the loins; and, independently of these distressing symptoms, her mind was additionally agitated by the alarming state of her husband, who was lying by her side.——

"I next saw Mr. Turner senior, with symptoms, in many respects, similar, thought not quite so importunate as in the two foregoing cases. Mr. T. had the burning sensation in the stomach, vomiting, inordinate thirst, headach, the face swollen, tension of the abdomen; the purgative symptoms had been more moderate. Mr. T. did not complain of light affecting the eyes; and the countenance was flushed, particularly on the upper part of the cheeks."—pp. 11—15.

Mr. Gadsden complained of a burning heat in the stomach, much nausea and vomiting, and severe gripings, with purging; extreme faintness, palpitation of the heart, headach, and trembling of the right arm and right lower extremity. He was also affected with intolerance of light and strangury, and his fæces were of an olive green colour.

Mr. Ogilvy and Mr. Marshall, in consultation, "resolved to persist in the purgative plan, and gave to each patient another full dose of castor oil, on two table spoonfuls of milk, and every four hours a solution of the *magnesiæ sulphas* with manna, in mint water; this dose to be alternated every two hours with the saline draught in the state of effervescence, letting the alkali predominate four grains to each dose, with the intention of neutralizing any possible remains of the arsenic, and relieving the disposition to vomit; and we further determined on persisting in the purgative system, until a more natural colour was effected in the alvine secretions. The patients were allowed to drink frequently, and in small quantities, milk, soda water with or without milk, and mutton broth."—"The thirst of each patient was so urgent, that they would readily have drank quarts, had they been permitted; and had we yielded to their request, the vomiting would have been at this time unnecessarily excited, and Mr. O. and myself were apprehensive it might tend to increase the inflammation on the villous coat of the stomach, and augment the symptoms of debility. The thirst was somewhat allayed by frequently washing the mouth with cold water."—pp. 16—18.

Eliza Fenning most obstinately refused all remedies, both on Tuesday night and Wednesday morning. She was then much better, but her face was flushed and swollen, and she

still complained of burning pain in the stomach, headach, and dizziness. She was removed to prison.

"On the following morning, March 22d, I visited the patients, who had all passed a restless night; the vomiting in each had greatly abated, the pain in the stomach was still violent, which they all compared to a furnace, or hot irons; the alvine discharges were changing to a proper colour, but intermixed with streaks of green, and highly offensive; the skin hot and dry, the pulse quick, varying in each case from 100 to 130, great thirst, and violent headach; their tongues white but moist; Mr. and Mrs. Robert Turner, and Mr. Gadsden, could not endure a strong light.

"The supersaturated saline draught *in actu effervescentiæ*, with the addition of manna, was ordered to be continued, and the purgative mixture to be omitted.

"Mrs. R. Turner's pulse was 130; this rapid circulation was accompained with constant sensation of fainting; but the bearing pains, with the pain in the loins, had somewhat abated.

"Mr. Gadsden appeared this morning to be the most afflicted; he had been seized with four epileptic fits in the course of the night, preceded by a violent palpitation of the heart, accompanied with a peculiar tremulous action of the right arm, and lower extremity; a considerable degree of symptomatic fever, insatiable thirst, a white but moist tongue, the face flushed, the respiration hurried, pulse 126, irregular and contracted, frequent gripings in the bowels, and spasmodic twitchings in the muscles of the chest and abdomen.

"Mr. Robert Turner, in the early part of the morning, had another attack of epilepsy; the symptomatic fever ran high, the pulse 120; he complained of spasmodic twitchings about the chest and abdomen, palpitation of the heart, great languor, accompanied with a constant sensation of fainting, tongue white, but not dry, occasional chills, followed by an increase of heat, headach, and vertigo. A dose of the purgative mixture was administered, and the same medicine as on the preceding day continued.

"Mr. Turner senior appeared much better; the pulse 90, skin temperate, tongue moist and cleaner; vomiting had sub-

sided, but the stomach was in great pain; he complained of extreme lassitude; the face was flushed, and he had slept about four hours.

"The faces of all the four patients were swollen, with a fixed redness, more or less, under the eyes and on the cheek-bones; they had vomited two or three times in the course of the night, by drinking too copious a draught of the diluents recommended over night, and each complained of the tongue and lips being sore and swollen.

"In the evening the febrile symptoms had a little abated, the pain in the stomach was intense, occasionally remitting and again returning with increased violence, with nausea and vomiting, much pain in the head, considerable thirst, and the bowels were open in each of the patients.

"Mr. Turner senior was better in many respects, and less oppressed by languor.

"The saline draught with manna was to be continued, and the addition of camphire mixture.

"Thursday the 23d, Mr. Robert Turner had slept three hours during the night, the skin was moist and more temperate, the tongue less coated, not dry, but sore and swollen, the burning heat in the stomach rather less violent, and he expressed a degree of hunger; the pulse 98, spasmodic twitches in the arms and legs, with a cold sensation in the latter.

"Mr. Gadsden had much fever, the respiration hurried, great thirst, violent and incessant palpitation of the heart, the fits had recurred twice in the night, he had had no sound sleep; if he went into a doze, he awoke suddenly, and much agitated; the pulse 120, spasmodic twitches, with tremor in the right arm and lower extremity, violent headach, and the eyes painfully affected by light; constant vertigo, which was increased if he attempted to sit up in bed, or upon the slightest exertion. A wine glass full of camphire mixture was ordered to be taken frequently. The patient received so much relief from this, that he asked for it often with eagerness. The saline effervescing draught, with manna and camphire mixture, was repeated every four hours.

"Mrs. Robert Turner has slept three hours in the course of the night; pain in the loins constant, with occasional bear-

ing down of the womb; the thirst rather less urgent, the pulse 110, headach, vertigo, great intolerance to light, the tongue white and moist, the skin hot, frequent palpitations of the heart, and a constant sensation of fainting; a numbness extending from the right side down to the foot; the burning sensation of the stomach was excited and increased by the motion of the child *in utero;* the face was flushed and swollen, and the tongue and lips sore, which extended along the course of the *œsophagus.*

" The same medicine as yesterday was continued, and a wine glass full of camphire mixture taken frequently when faint.

" Mr. Turner was considerably better, the pain in the stomach occasionally troublesome, the appetite returning, the face less swollen, but flushed and red under the eyes and on the cheek-bones, extending towards the ears.

" Friday the 24th, the febrile symptoms had considerably subsided in each of the patients, and they had passed a more tranquil night. They complained of a variety of singular nervous affections, tingling and burning sensations in the hands and feet, in Mr. R. Turner beginning at the extremity of the fingers, and gradually creeping to the shoulders; sometimes one foot, and at others both affected with a burning feel, commencing at the toes, and gradually rising above the ankle joint: palpitation of the heart, great depression of the spirits, with a perpetual sensation of swooning, and frequent twitchings of the muscles of the chest and abdomen, and of the upper and lower extremities.

" Mr. Gadsden had experienced in the night only one attack of the epileptic fit, and had slept three or four hours towards the morning; the pulse 100, the breathing less hurried and more natural. The vomiting in each patient had wholly subsided, but they all endured the burning feel in the stomach.

" Mrs. Robert Turner complained of violent headach, and to light she had still a great objection, as it, immediately on accession, increased the headach; at times the heart palpitated strongly, the thirst was considerable, the pulse 100, the tongue less charged and moist, the child *in utero* moved with vigour,

and whenever this occurred, the pain in the stomach was increased, with nausea.

" Mr. Turner senior was nearly recovered.

" Thes ame medicine continued, with the camphire mixture.

" In the evening they were all four evidently in a progressive state of convalescence; the febrile symptoms diminished, the pulse slower, less tremulous and contracted, more natural and open in the beat: the pulse in Mrs. R. Turner continued at or about 100 for a fortnight afterwards."—pp. 16—24.

" On the next morning, Saturday the 25th, the symptomatic fever in each patient had wholly subsided, their tongues were cleaner, and the nervous symptoms much the same as on the preceding day; the appetite returning, and Mr. R. T. complained of hunger more than the rest. Well boiled vegetables, puddings, eggs, and milk, were recommended, and he was enjoined most carefully to abstain from animal food and fermented liquors.

" Mr. Gadsden had a relapse of the fit shortly after I had left him over night, which had been preceded by palpitation of the heart, and the tremulous agitation of the right arm and lower extremity; the fit lasted near two hours. They all still complained of the burning heat in the stomach: this symptom was constant and more severe in Mrs. R. Turner, who had it without intermission: this was attributed to her peculiar situation, the viscera pressing more constantly upon the tender state of the coats of the stomach; and Mrs. R. T. felt, for many days afterwards, an intolerance of light, accompanied with headach; she persevered in the recumbent position for a fortnight afterwards, which relieved the pain in the loins, and kept off, or lessened, the disposition to the bearing pains of the gravid uterus.

" On the following day, Sunday the 26th, they were all convalescent, except Mr. Robert Turner, who had gone contrary to my directions, by eating at dinner on the preceding day a free portion of animal food, and drinking a tumbler of porter, which caused a slight relapse of the fever; and he endured so much pain in the stomach, that he readily promised not to touch animal food or porter again, until fully permitted. Mr. R. T. had passed a restless night, with much thirst, and was

again attacked with the spasmodic twitchings in the chest and upper and lower extremities; he took a dose of the cathartic mixture, and, by afterwards living on a low diet, and then strictly adhering to my directions, having suffered so severely by this transgression, this patient was soon relieved from the exacerbation of the symptoms."—p. 26, 28.

"Mr. Gadsden experienced an epileptic fit at eight o'clock the preceding night, and it returned daily and periodically, about the same hour every evening, for a fortnight afterwards; the fit generally lasted near two hours, and he required, from the violence of his struggles, the assistance of several persons to hold him whilst the epilepsy continued. On recovering he looked wild, forgot where he was, and talked incoherently; and as he gradually emerged from this state, complained of extreme languor, with great prostration of strength. Towards the latter end of the second week the fit became shorter, and less severe, and he sooner recovered when out of it; and at the expiration of a fortnight from the first effects of the poison, he enjoyed an interval of seven or eight days without a relapse; but they again returned, with the same or even greater degrees of violence, and it is necessary to state, that Mr. G. has been afflicted with the fits up to the present time; he was then about seventeen years of age, appeared to have outgrown his strength, possesses very delicate stamina, and serious apprehensions are still entertained of the result, as the fits hitherto seem not in the least to yield to the remedies that have been employed. I attended Mr. G. about three weeks, but he was obliged to leave Mr. Turner's office, and return to his parents, in consequence of the frequency of the relapse of these fits.

"On the 30th Mr. R. Turner complained of a very singular affection in the upper and lower extremities; the arms were several times in the course of the day seized with a numbness and prickling feeling, accompanied with a sense of great weight, like what is commonly called the part being *asleep;* and this symptom continued daily, more or less frequently, for six weeks, but, upon raising the arms in an upright position, it immediately subsided. The same feeling almost as constantly attacked the legs, but occasionally with, and sometimes without, the corresponding affections of the arms; the

legs were some minutes longer affected, by reason of his not being able, as he himself observed, to place them in the same position as the arms."—pp. 29—31.

" Mr. and Mrs. R. T. and Mr. G. for many weeks afterwards, in attempting to reach an object by extending either arm, found the fore-arm suddenly contract towards the chest, causing them frequently to miss their aim. This may be considered as a very peculiar and uncommon symptom.

" Mr. T. senior, for some time afterwards, had daily attacks of a burning sensation in one or both feet.

" It is curious to remark, that none of the patients complained, or had the slightest sensation, of the itchings of the skin, —a symptom particularly observed by Dr. Orfila in his general system of Toxicology, and also by Dr. Roget in his case of recovery from the effects of arsenic. Mrs. R. T. did not even complain of such a sensation, although she experienced an entire change of the cuticle."—p. 119.

Mr. Gadsden went to Cheltenham for some time, and returned apparently greatly improved in his general health, and the fits having left him about three weeks, he resumed his situation in Mr. Turner's office; but he relapsed, and, three months subsequent to the commencement of the attack, they again returned, at least three or four times in 48 hours. For some minutes, his sensations and distress of countenance generally indicated their approach, and his health and strength suffered materially. He was again recommended to change the air, from which he derived considerable benefit; but although a period of two years has elapsed since the first attack, he is still subject to frequent and severe recurrences of this frightful disease.

Such are all the material facts in these singular cases, as detailed by Mr. Marshall, with some omissions and transpositions. There can be no doubt, that the symptoms were owing to arsenic having been mixed with the yeast dumplings, as it was present in them in so palpable a form, and in such quantity, that white opaque particles were perceived pretty thickly distributed throughout the mass, which was conjectured to be arsenic; and next morning Mr. Marshall obtained from an earthen pan in which the yeast dumplings had been kneaded,

more than half a tea-spoonful of white arsenic, whose identity was ascertained by Mr. Hume of Long-Acre.

After these observations, we would not allude to his experiments on the decoction of onions; but that it gives us an opportunity of mentioning the curious facts that gave rise to them, of which we regret that we have not any accurate report, and of pressing upon our readers the necessity of always instituting comparative experiments in such an inquiry. In consequence of a trial for a suspected murder by poison, at Launceston assizes, in Lent 1817, it was discovered, that a decoction of onions gave a green colour with ammoniaco-sulphate of copper, and a yellow colour with ammoniaco-nitrate of silver, which had been relied upon by the prosecutor as evidence of the presence of arsenic in the contents of the stomach, and, as he was not prepared to redargue the facts, the pannel was of course acquitted. Mr Marshall, however, comes forward to remove all the difficulties suggested by this discovery.

" It appears, on a cursory view, that these tests, of which they employed only *two*, underwent some deteriorations, from their detail of experiments upon a decoction of onions producing the yellow and green *precipitates*. Indeed, the learned judge emphatically observed in his charge, that the onion *liquor* was always thrown away, and the vegetable itself only used. In consequence of the sophistical reasonings produced in the course of the medical evidence, this publication has been retarded until every satisfactory information could be derived from experiment to show the fallacy of the inductions.

" This chemical investigation was instituted principally with a view to substantiate scientific facts, and to behold the validity and accuracy of the ammoniaco-nitrate of silver particularly, as well as the ammoniaco-sulphate of copper, as re-agents; for until this part of the evidence be refuted, the general confidence of the faculty in them may probably be lessened. However, let any one thus biassed by such erroneous conclusions, or still entertaining a doubt, go through the same ordinal investigation about to be submitted for consideration, and he must immediately derive perfect satisfaction, by the palpable variation arising from the experiments.

" In short, these tests for the detection of arsenic, are of too

much importance to the professional world to be hastily abandoned, more especially as hitherto the science of chemistry is principally limited to them and their various modifications, until superior criteria are discovered. They must still remain the foremost in efficacy as already stationed and fully admitted in the scale of chemical affinities for detecting the presence of this poison when in a state of *solution*." pp. 146-7.

Mr. Marshall found that decoction of onions did not produce any precipitate with the re-agents employed, whereas his solution of arsenic did, in a very palpable degree. This is, no doubt, correctly stated; but two other facts are necessary to be known; that a very dilute solution of arsenic produces no precipitate with these tests, and that a decoction of onions, or other mucilaginous vegetable, prevents the production of a precipitate, when it would otherwise have taken place.

Mr. Marshall's experiments on the decoction of onions are in themselves correct; but he should have repeated them on a decoction of onions, to which a small proportion of solution of arsenic had been added, before he ventured to defend the tests of ammoniaco-nitrate of silver, and of ammoniaco-sulphate of copper, as being in every case infallible.

We are afraid our readers are tired of this long discussion; but we hold it to be of great importance, on account of the practice of our courts in receiving the evidence of all medical men as competent, and as nearly equal in point of conclusiveness; and of the presumption of our less informed and less cautious brethren, in giving evidence in cases of extreme difficulty, on which they have not bestowed the due degree of consideration, and which their previous knowledge has not even qualified them to investigate.

BIOGRAPHY.

Memoir of Abraham Gottlob Werner, *late Professor of Mineralogy of Frieberg.*

[From the Philosophical Magazine and Journal, for September, 1817.]

Abraham Gottlob Werner was born on the 16th of September, 1750. His father, who was inspector of an iron-work at Wehrau, on the Queiss, in Upper Lusatia, intended him from his early youth for a similar vocation. He first went to school at Bunzlau, where he received however but very scanty instruction. In order fully to qualify himself for his intended profession, he went first for some years to the Mineralogical Academy at Frieberg, and then to the University of Leipsig, where he applied himself to the study of natural history more than to that of jurisprudence; and in respect to the former used to boast in later years of his intimacy with two distinguished naturalists of Leipsig, Mr. John Charles Gehler, and his brother John Samuel Traugot Gehler. Even while at the University he employed himself on the doctrine of the external characteristics of fossils, in which a singular quickness of perception was of great use to him; and published there, in the year 1774, the well known work (on the external characteristics of fossils) which is still considered as the basis of his whole oryktognosis, but of which he could never be induced to print a new and enlarged edition, because he feared disputes, and had not in fact concluded his researches. Soon after he was invited to Frieberg, to have the care of the cabinet of natural history there, and to read lectures upon it. Here his mind, which was early exercised in observation and classification, found the most welcome materials. Here, daily extending the bounds of his science, and supporting its foundation by the surest external distinctive marks, he formed that system which, afterwards embracing also the geognosis which was peculiarly his own, and forming an intimate connexion with all branches of the art of mining, gradually conquered all

opposition, and raised its inventor to the rank of the creator of a new mineralogy, which might be supported and extended, but not rendered useless by the crystallographic theory of Haüy, and the chemical theory of Vauquelin and others. His peculiar talent for observation was animated by the most lively fancy, assisted by the most extensive reading in every branch of knowledge connected with his own, and excited by daily intercourse with ingenious travellers and foreigners, who chiefly visited Frieberg on Werner's account. (We may instance only the Englishman Hawkins.) The classification in genera and species, and for the most part ingenious appellations of minerals down to the newest *egron*, is peculiarly his. "Werner," says Leonhard, in his eloquent lecture on the state of mineralogy, "was for the doctrine of the recognition of simple fossils, embracing with uncommon ingenuity all the experience of his age, what Winckelmann had been to the arts. What, before him, were all the endeavours of Wallerius and Linnæus!" How soon was he obliged to give up Cronstedt, who is no where satisfactory! Only too scrupulous, conscientiousness prevented him from publishing the oryktognostical tables, which have been finished, and quite ready for the press these four years. The attempt of the ingenious Berzelius, of Stockholm, at classification, by discovering the laws of combination of the elements, did not indeed shake his belief in the method of recognition by means of the external characteristics; yet he at last thought that a mutual conciliation was possible, and reserved the first analysis of the latest writings of Berzelius, for the next winter. Block's work was known to him. He approved of his ingenious scholar's (G.H. Schubert's) essays (*Ausgleichungsversuche.*) In the geognosis, first systematically deduced by him from the rough mass, crystalline structure, and the chemical relations of the contents, may be called in, together with the ties of external affinity; but the method created by Werner is the only satisfactory one, however much may yet be wanting to it, to become a complete system of the earth. His predecessor Charpentier's doubts respecting Werner's theory have never been able to shake it. His idea of formations, one of the most fruitful of consequences, and the most ingenious, in Werner's geognosis, has been ad-

mirably developed by his scholar Steffens in Breslau; and his formation of the flœtz mountains of Thuringen, well supported by the excellent Von Freiesleben, in the theory of the copper-slate mountain (*Kupferschiefergebirge*). Werner sustained an obstinate, but for that reason the more honourable contest with the volcanists. Now, no well-informed person will consider the basalt and other flœtz mountains as of volcanic origin. Werner's theory of the older and newer formation of mountains, by the waters, stands immoveable; and a satisfactory link between them is afforded in the mountains of the interval of transition. Even the new chemical discoveries of the *kalimetals* may be made to accord with it. Another science, Mining, on which Werner used also to lecture, was rendered extremely clear to the attentive scholar, by his luminous explanation and by the reduction of the most complicated machinery to the most simple propositions, at the same time drawing all the figures on his table. Indefatigable application, insatiable thirst of knowledge, enriched his retentive memory with every thing that history and philology, in the most extensive sense, can offer to the attentive inquirer. No science was foreign to him. All served as a basis to his studies, which were constantly directed to natural philosophy, and the knowledge of the earth and its inhabitants. He always advanced before his age, and often *knew* what others only *presumed*. After 1779 and 1780, when he first lectured on oryktognosis and geognosis, at Frieberg, he was heard with gratitude by scholars from all parts of Europe. Never contented with what was discovered, always seeking something new, he rather formed scholars who wrote than wrote himself. But many MSS. almost wholly ready for the press are included in his fine library, collections of coins and MSS. bequeathed on the day of his death to the Mineralogical Academy, for 5000 crowns. In his lectures he had only heads of the subject before him. In lecturing he used to abandon himself, as he was accustomed to say, to the inspiration of his mineralogical muse; and when his spirit hovered over the waters and the strata, he often became animated with lofty enthusiasm. But he caused his lectures to be written out by approved scholars; and by revising himself what they had thus written after him, made it, properly speaking, a MS. A great

many parts of his lectures have been made public by others, among which may be reckoned what Andic, at Brunn in Moravia, has published in the valuable journal Hesperus. But nothing bears the confirmation of the seal of the master. What is particularly desirable is the publication of his manuscript on Mineralogical Geography (which he only once drew up for a particular lecture), and upon the Literature of Mineralogy, in which he solved the difficulties of the ancient classic mineralogy, and gave incomparable illustrations of Pliny's Natural History. He was like a father to all his scholars, to whom he was a model not only as a man of science, but as a moral character. Having filled, from the year 1792, a high situation in the Council of the Mines, he had a great share in the direction both of the Mineralogical Academy and of the administration in general. Two things must be mentioned here with particular honour—the works begun in 1786, to furnish a great part of the deeper mines with water, in order to get water for driving the wheels. This astonishing aqueduct, particularly the artificial canal of Doerrenthal, with its subterraneous bricked channels, already extending above a league, are in the main due to him, though Scheuchler made the plan, and Lampe the calculations. By the continued support of the ever active king of Saxony, this great work still proceeds in the most prosperous manner. The Amalgamation works, twice built by the excellent Charpentier, chief of the Council of the Mines, (the first building was maliciously burnt down,) and for ever secured by most ingenious fire-engines from similar accidents, are indeed unique:—a miracle to all who behold them, and a jewel in the crown of the Saxon art of mining, and of the unostentatious energy with which the sovereign of Saxony caused the most expensive undertakings to be executed in silence. Less known and visited by foreigners, though on it depends the continuation of the mining in Saxony, is this undertaking of canals and aqueducts, which has already cost above half a million of crowns, and on which more than a thousand men are employed. The mineralogical survey and description of all Saxony, divided into districts, which has been prosecuted for these twenty years, under scholars of Werner, and includes the forest of Thuringen, and even a part

of the Harz, uniting too with the mountains on the frontiers of Bohemia and Silesia, will one day give our country a mineralogical map, which for exactness and extent surpasses what any other country can produce. This too was Werner's work, and was constantly directed by him in the most attentive manner. In his visits to Prague and Vienna, he found means to interest the Austrian government in these mineralogical surveys; and it is to be hoped that the enlightened Bavarian government, as well as the direction of the mines in the Prussian monarchy under Werner's grateful scholars in Berlin and Silesia, will readily contribute to support and complete the great work which Werner so happily set on foot. In England and Scotland excellent mineralogical maps of single counties have lately been published according to Werner's ideas. His cabinet of minerals, unrivalled in completeness and scientific arrangement, and consisting of above 100,000 specimens, has become, in consideration of a life annuity, the amount of which devolves to the Institution itself, the property of the Frieberg Mineralogical Academy. Werner's favourite pupil Koehler is appointed inspector of it. Werner had received from England an offer of 50,000 crowns for it. He sold it to his country for 40,000, of which he reserved the interest of 33,000 as an annuity; but made the condition, that after his own death, and that of his only sister, who is without children, the interest should continue to be annually paid to the Mineralogical Academy; so that this, his only daughter, as it may be called, obtains an additional annual income of 1600 crowns.

Werner's literary studies, like his mind, embraced every branch of science. Every thing excited his thirst of knowledge; and thus it often happened that he dedicated all his attention to researches which seemed to lie entirely out of his sphere. His inquiries into the direction of the mountains of the first and second formation, led him to the seat and the migrations of the aboriginal tribes and their branches. To this were soon joined inquiries into the original languages and radical syllables, which he prosecuted with the greatest acuteness, and reduced into tables. Soon arose an universal glossary of all the radical syllables and characteristic sounds, in all the

languages with which he was acquainted; which he studied with ardour, and to complete his knowledge of which he purchased the most expensive works; thus he gave sixty crowns for Hickes' Thesaurus, and but lately eighty crowns for Walton's great Polyglot. His antiquarian researches into the mineralogy of the ancients made him a passionate friend of archæology, and most of the works on that subject were purchased by him. One branch of archæology, the numismatology of the ancients, had become so favourite a pursuit with him during the last eight years of his life, that he purchased entire collections of medals, and in a short time was in possession of above 6000 ancient Greek and Roman coins: this enabled him to make interesting researches into the different mixtures of the metals and on the arts of adulteration; and in order to make all more clear, he arranged entire series of false coins. An unedited silver coin of his collection, which he gave to the great connoisseur Catauro, in Milan, is still the subject of a numismatic controversy between the Vienna and Italian connoisseurs. The examination, which was to be printed, was intended to be dedicated to Werner. The practice which he had had in studying the direction of the mountains and the surface of the earth, made him an excellent judge of ground, and inspired him with a great fondness for military tactics. He studied the art of war with great diligence, read the accounts given by masters in this branch, and acquired a fine collection of military books. Officers of the engineers and general staff were surprised to hear him speak of the mistakes committed by the allies from want of due knowledge of the ground, in their attack upon Dresden in August 1813, where he happened to be present. His name was mentioned at the head quarters of the allied sovereigns at Frankfort, and he was invited to repair thither; but his inflexible attachment to his king made him decline the invitation. Medicine also attracted his attention, at first as lying in the circle of the sciences connected with natural history, but afterwards in the latter years of his life, that he might be enabled to judge of the bodily sufferings of himself and others; so that medical books were his favourite reading, and conversation on medical subjects what he preferred to every other. Ever ready to afford assistance,

he was happy, when he visited a sick friend, to be able to give medical advice, and also to judge of his own situation, which he often thought precarious. The danger of such an inclination, which can never lead to any thing further than empiricism, is evident. His best friends, among whom we may reckon the veteran of the healing art, the venerable Dr. Kapp, at Dresden, sometimes reproved him for this, but it remained his favourite hobby-horse. He had made a very witty table of diseases according to the stages of human life, from infancy to old age: he was a sworn enemy to vinegar and all kinds of milk diet, but a determined beef-eater. In other respects he lived very temperately, drank but little wine, and was especially and anxiously careful about warm clothing and warm rooms. He first visited Carlsbad, when a boy of only fourteen years of age, and had since been there forty-one times. Here, even in the latest part of the autumn, he always acquired new strength. Had not imperious circumstances hindered him this time from visiting sooner the salutary fountain, which had become absolutely necessary to him, he would perhaps have still lived. He was fond of travelling, and spoke with emotion and pleasure of his visit to Paris in 1802, where he was received with the greatest respect. Though not indifferent to external distinctions, to the diplomas of foreign academies and learned societies, he never sought or asked for them, and in conversation never attached any value to them. However, he was justly proud of being a member of the Institute of France, and of the Wernerian Society in England. Even on his death-bed, he learnt with joy from his former pupil and faithful friend, the Professor of Natural History at Edinburgh (Jamieson,) that not only several mineralogical societies flourished in Great Britian, but that professorships of mineralogy on Werner's principles were founded at Oxford, Cambridge, London, Glasgow, Cork, Dublin, and Belfast. At his suggestion a union of friends of natural philosophy and mineralogy was formed last winter in Dresden, where Werner himself presided. He was in the best sense of the expression a citizen of the world. Every newspaper that he read, excited in him a pious wish for the happiness of mankind, for truth and justice. In the last days of his life, his eye was most

frequently directed to the Brasils, where the excellent Oranjo was his friend, and many Germans now employed there his scholars. In his thoughts he followed every traveller, and put questions to him, in his own mind, such as Michaelis once wrote for Niebuhr and Forskael. His house was the constant rendezvous of curious travellers, from all countries and of all ranks; and he showed to them all, with uncommon patience and attention, his museum, and especially his collection of precious stones, which excites surprise by the value and variety of the specimens. He did not, however, like writing letters, because he preferred personal intercourse to every thing, and dreaded a loss of time. This disinterested participation, in whatever promoted in any country the interest of knowledge and humanity, did not hinder him from being the most faithful son of his own country, the most loyal reverer of his king. He refused every invitation from abroad, (and he received at an early period several very brilliant and enticing ones,) and was for many years contented with a very moderate salary, supporting himself by private lectures. He made presents to all the academies and public schools of Saxony, and endeavoured by this means every where to excite a predilection for natural philosophy. Those who were most intimately connected with him, enjoyed his tenderest interest and care.—"In his house," says Boettiger, in his farewell address on the eminence of Gorbitz, "company daily assembled for his advice; and the same hand with which he felt the pulse of nature, raised and supported every unfortunate. His simple manners, his cordial cheerfulness, and his social playfulness, made him the favourite of his fellow-citizens. When Werner entered, every countenance brightened; the women, too, loved the company of a man who, without insipid compliments, always had something delicate and entertaining to say to them. In his earlier years his feeling heart would doubtless have made him highly susceptible of enjoying the sweets of domestic life: but he did not find what he sought. In later years he renounced the idea of them, out of love to science, and was fully indemnified by the cordial attachment of his pupils and friends. Penetrated with that true devotion which worships God in spirit and in truth, he often preached to his pupils the purest

morality, which he confirmed by his own example; and even in his lectures often rose with genuine enthusiasm from the miracles of nature to their Divine Author.—Such was the man of whom his contemporaries and his country will be always proud; a man equally distinguished by his rare learning, and by his goodness of heart and unspotted character. How just is the grief caused by such a loss! His fairest monument is the gratitude of his pupils, who are spread over all the countries of the world. But his doctrines and his life will not fail of public acknowledgment and praise. This tribute will be given him from France, England, and Italy. Neither must the tongue of his pupils in Germany be mute. May Von Leonhard dedicate to him his second lecture in the Academy at Munich! May Steffens, Ullmann, Hausmann, Mohs, Moll, Linke, and Weiss, and above all the feeling Schubert, speak of him! May Gilbert, who defended him against the violent Chenevix, erect a memorial to him in his Annals!—Nor can we doubt but some monument of marble or bronze will be raised to his memory, to which British gratitude and generosity will gladly subscribe, and Frieberg afford a suitable situation to be inclosed for the purpose. For the present we hope that Böhme, or Buchhorn, will engrave the fine portrait of him, by G. Von Kugelchen, in Dresden, which was intended for his museum, for the satisfaction of his numerous scholars and friends. His most glorious monument, however, will always be the Mineralogical Academy, preserved in uninterrupted activity by his worthy scholars; that academy which he himself sometimes called his beloved daughter, and richly endowed; those who go thither on a pilgrimage, those who there receive instruction, will pay continued homage to the manes of WERNER.

ORIGINAL PAPER.

FOR THE ECLECTIC REPERTORY.

Case of diseased Ovarium.

BY EZRA MICHENER.

From the acknowledged importance of morbid anatomy as a branch of medical science, it is presumed that the following case will not prove uninteresting to you.

About four weeks since I was requested, by a friend of hers, to visit Rosanna Albert, at her residence in Small street. From the account then obtained, and afterward confirmed by herself, it appears, that somewhat more than seven years ago, a small tumour was perceived in the left hypogastrium, and had been gradually increasing ever since. Little inconvenience was experienced from it, until the compression and displacement of the abdominal viscera began to impede their functions. She never bore children, but has menstruated regularly up to the present time. During this long period several respectable physicians had been consulted in vain, and the whole legion of empyric arcana exhausted to no purpose. Some time previous to my seeing her, the abdomen began to increase more rapidly, the breathing grew more difficult, and her lower extremities became œdematous. All these symptoms increased in violence, as the tumour grew larger.

On entering her apartment, I found her resting in a half-recumbent position, breathing hurried and difficult, voice scarcely intelligible, countenance extremely anxious, feet and legs cold and œdematous, the abdomen enlarged to the size of a woman at the full period of utero-gestation, and the pulse, though feeble, indicating a degree of turbulent excitement compatible with the deranged state of the system. On examining the state of the abdomen, a hard irregular tumour was easily discovered occupying the left and middle portions of the great cavity, and

extending from the pubes and ileum quite up to the cartilago ensiformis. No fluctuation was perceptible in the tumour, but the right side of the cavity indicated an effusion.

The previous history and present symptoms all induced me to believe it was an ovarian disease, but whether scirrhous or hydropic I could not so satisfactorily determine. The want of fluctuation in the tumour, and its slow regular progress, bespoke its scirrhous nature; while an exemption from those lancinating pains peculiar to scirrhus, its monstrous size, and the general effusion, indicated a contrary opinion. With a view, however, of removing the watery effusion and thereby rendering the case less complicated, I resolved upon the use of diuretics. But when the medicine was furnished, she positively refused to take it, on the supposition that her disease was incurable. On the following day Dr. James saw her, and by his opinion confirmed the one just offered, as to the disease, and the means likely to relieve it.

Some days after she again consented to try the effect of medicine. She now came under the care of the Southern Dispensary, as a patient of Dr. Haydock, who had recourse, immediately, to diuretics. After a day or two she again refused all medicine and he discontinued his attendance.

About this time the skin, covering the legs, no longer able to resist the distending force of the gravitating fluid, which her position determined to them, (for she now reclined herself in an easy-chair with her feet depending,) opened a thousand pores, through which the percolating fluid continued to pass off, and trickle down to the floor beneath. Although the swelling of the limbs subsided a little after this drain was established, yet her strength rapidly declined, her breathing became more difficult, and an extensive sphacelus having reached from the left foot to the knee, she was at length released from the trammels of a life which had long ceased to afford pleasure to its miserable possessor.

Soon after her decease, and in compliance with her special request, I received an invitation to examine the body, which I proceeded to do twelve hours after death in company with Dr. Haydock and J. B. Price. The dropsical swelling had greatly subsided, and no fluctuation could be perceived in the right side. An incision was carried from the sternum to the

umbilicus, and thence to the spinous processes of the ilia, exposing the great cavity. An enormous tumour now presented itself to our view, occupying the left and central, while the displaced intestines held the right portion of the cavity. Its general appearance might have been aptly compared to that of the gravid uterus, had it not been for some irregularities, yet to be described. Very little fluid was found in the great cavity. The fallopian tubes were found to arise from the lower and posterior part of the tumour, where there was a small prominence resembling the back part of the uterus. The right tube and ovary were in a natural condition, the left tube was enlarged, and had its fimbria closed into a round flesh-like mass, and a scirrhous tumour, supposed to be the corresponding ovary, about the size of a walnut, was attached to the great tumour near the extremity of the tubes. The omentum had formed adhesions with the upper part of the tumour, the vessels of which were greatly enlarged. The pancreas was found much enlarged and in a scirrhous state.

The tumour was next removed by dividing the omentum just mentioned, and the broad ligaments, separating it from the bladder and rectum, and finally cutting through the vagina below the os uteri. We now found the uterus and tumour so intimately united as to render it impossible to distinguish or separate them. It weighed and measured as follows.

Weight after the water (about lbj.) had been evacuated, - - - - -	8 lb. 10 oz.
Perpendicular diameter, - - - - -	12 inches.
Antero-posterior do. near the upper end, -	9
lower end, - -	$5\frac{1}{2}$
Mean lateral diameter, - - - - -	$5\frac{1}{2}$
Antero-posterior vertical circumference, - -	33
Horizontal circumference near the upper end, -	$22\frac{1}{2}$
lower end, -	$16\frac{1}{2}$

A firm dense coat, about two lines in thickness, resembling the substance of the uterus, and continuous with it, covered the whole tumour. This covering had numerous circular openings in it, through which a gelatinous fluid was protruded, distending the peritoneal coat into sacs of various sizes. This fluid was easily returned on pressure, yielding the impression,

to the touch, of a reduced exomphalos. An incision was next made through the posterior part of the uterus, and its cavity exposed. The os and cervix uteri, as well as the lower part of the body of the uterus, was in a healthy state, but three scirrhous tumours occupied its fundus and in some degree enlarged that part of its cavity. The state of the cervix explains the phenomena of menstruation already noticed. The body of the tumour, superior and anterior to that of the uterus, was now laid open and its contents examined. It was composed of a great number of scirrhous tumours of various sizes, from that of a pea to two or three inches diameter. Some were contained in the substance of the uterus and sac, others adhered firmly to them; but the greater number were connected to the sac, and to each other, by a peculiar delicate cellular membrane which was found floating in a gelatinous fluid, and on which the blood-vessels were spread in the most beautiful manner.

The whole of the appearances in dissection were such as to leave no doubt in our minds of the disease being uterine. It probably commenced on the anterior or left side of the uterus within its substance, dilating the external portion, as the disease advanced, without affecting the cavity, until it attained the astonishing size just mentioned.

It is a wish to give you a counterpart for Dr. M'Dowell's Paper* that induces me to offer this account for your disposal.

While his hand holds forth the successful blade as an ensign for the bold and dexterous surgeon, may I humbly point to the dangers which lurk under the obscure and delusive indications of this species of disease.

It is much to be regretted that cases so interesting to the community as those of Dr. M'Dowell's, and as novel as interesting, should come before the public in such a manner as to frustrate the intention of becoming useful.

Far be it from me to arraign the probity of Dr. M'Dowell. If the cases he relates are, as I sincerely hope them to be, correctly stated, no remarks of mine can detract from his merit.

From the account of his first patient we learn that she rode sixty miles on horseback, (to Danville.) In performing the ope-

* Eclectic Repertory, Vol. VII. page. 242.

ration he says, "I made an incision about three inches from the musculus rectus abdominis on the left side, continuing the same nine inches in length, parallel with the fibres of the above named muscle, extending into the cavity of the abdomen, the parietes of which were a good deal contused, which we ascribe to the resting of the tumour on the horn of the saddle, during her journey." How, I ask, could the horn of the saddle contuse the left side three inches from the rectus muscle? Again, "the tumour then appeared full in view, but was so large that we could not take it away entire. We put, &c.——. We took out fifteen pounds of a dirty gelatinous looking substance. After which we cut through the fallopian tube and extracted the sac which weighed seven pounds and a half." He adds, "as soon as the external opening was made the intestines rushed out upon the table. We then turned her upon her left side, so as to permit the blood to escape." Further, "in five days I visited her, and much to my astonishment, found her engaged in making up her bed."

By the second case we learn, that the adhesions were so strong that he could not extirpate the tumour, "but by way of experiment, I plunged the scalpel into the diseased part." Much blood, and a gelatinous fluid was discharged. The wound was closed and the patient recovered.

In the history of the third case we find nothing very remarkable, except where he tells us, "I found the ovarium much enlarged, and as it could be easily moved from side to side, I advised the extraction of it." But in the next sentence says, "as it adhered to the left side, I changed my place of opening to the linea alba." He afterward turned the tumour out without any mention of adhesions.

The utter impossibility, of our ever being able to ascertain with certainty the real nature of those internal diseases; the delusive nature of all their indications, and the necessary danger of an operation under the most favourable circumstances, will be likely to prove an insurmountable barrier to the use of the knife in their removal; as few persons will be likely to venture their reputation on such uncertain data.

EZRA MICHENER.

Philadelphia Dispensary, 7th Mo. 27, 1817.

Extract from a Memoir, entitled Chemical and Physiological Inquiries on Ipecacuanha, read before the Academy of Sciences of Paris, February 24, 1817. By Messieurs PELLETIER and MAJENDIE.

[Translated for the Eclectic Repertory.]

THE authors of this memoir, fully convinced that we have not acquired that degree of information respecting this valuable root which the present state of science would permit, have subjected it to new experiments, and have added to our knowledge many facts striking and highly interesting to chemistry and medicine.

After giving a concise history of ipecacuanha and pointing out, *in a summary manner*, the principal results obtained by the later chemists who have engaged in the inquiry, Messrs. Pelletier and Majendie proceed to explain the course they pursued in the analysis of the brown ipecacuanha, procured from the *Psycotria emetica*. They first examined the cortical part, which they treated with repeated portions of sulphuric ether, and had recourse even to a slight degree of heat, with the view of obtaining whatever was soluble in this menstruum. After the ether, they employed highly rectified alcohol, which was renewed until it excited no further action, even when aided by a boiling heat. The powdered ipecacuanha, treated in this way and no longer acted on by these menstrua, was dried and then subjected to the successive action of cold and boiling water. They considered the residuum from these experiments as an inert and ligneous substance. Each of the products of these several operations was subjected to a particular examination.

The ethereal tinctures were of a fine golden yellow; being distilled, the first products were inodorous, the last possessed sensibly the odour of ipecacuanha. The residuum after evaporation yielded a fatty matter, of a brownish yellow colour, when in mass, but dissolved in alcohol or ether it imparted a golden yellow to these liquors. It is nearly tasteless, but the odour is very strong and resembles that of the essential oil of horse-radish. It is rendered insupportable when raised by heat. Attenuated, it resembles that of ipecacuanha; in this

matter, therefore, resides the odour of this root. The fatty matter is heavier than alcohol and possesses the specific gravity of water. It melts immediately on being heated. The action of heat disengages an evanescent oil of a very pungent odour; but the larger portion of this matter is decomposed before it is volatilized, and affords the same products as highly hydrogenated vegetable substances when decomposed by heat. The oil no longer possesses the properties and odour above described, but is intensely empyreumatic. If water is distilled on this fatty matter, it acquires a strong odour of ipecacuanha, and an evanescent appearance is formed on the surface by this volatile oil.

Hence we conclude, that ipecacuanha contains two kinds of oil; one volatile, highly evanescent, constituting the odorous principle; the other fixed, fatty, possessing little or no odour, insoluble in water, but soluble in alcohol and in ether. The alcoholic tinctures deposited, by cooling, slight flocculi, which, collected on the filter, were ascertained to be wax. These tinctures had a yellow brown colour. Evaporated in covered vessels on a water bath, they afforded a residuum consistent and of a saffron red colour. This residuum was taken up by cold water, and nearly all dissolved; a small portion of wax was separated by this means. This watery solution was likewise evaporated, the product was very deliquescent, slightly acid, of a bitter and slightly acrid taste, and without odour. The carbonate of barytes was added to separate the acid; the solution was deprived of acidity, but the extremely minute proportion prevented its being separated from the carbonate of barytes, employed in the experiment. The authors are of opinion, that it is the gallic acid, for the acid liquor turns the solution of the acetite of iron green. This solution, after being treated with the carbonate of barytes, was precipitated by a suitable proportion of the acetite of lead, and almost completely deprived of colour. The sub-acetite of lead renders it completely colourless. The greyish precipitate which is thus obtained, being edulcorated, and greatly diluted in distilled water, was exposed to a current of sulphurated hydrogen, to separate the lead; after this series of operations, the substance remaining in solution was discovered to be highly emetic, and

as exclusively possessing the property belonging to ipecacuanha. It was therefore very carefully experimented on, and occupies a considerable portion of the memoir; these experiments we shall extract entire.

Of the Emetic Substance.

From the experiments we have related, we are made acquainted with some of the properties of the emetic substance, as its solubility in water; its deliquescence; the action of alcohol; its insolubility in ether; but with the view of affording more complete information, we shall present a distinct account of the action, and of the several chemical re-agents to which it was subjected.

The emetic substance, when dried, assumes the form of transparent scales, of a brownish red colour; it has scarcely any odour; it has a bitter and somewhat acrid taste, but no wise nauseous. The emetic substance undergoes no change at a temperature below that of boiling water, and is not fusible at a higher degree; it swells, grows black, is decomposed, imparts to water carbonic acid; small portion of oil; of acetic acid; the residuum is a light spongy coal; there are no traces of ammonia, which demonstrates that azote does not enter into its composition.

Exposed to the atmosphere, it undergoes no change; if the air is humid, it becomes moist by absorbing the *hygrometre* water. Water dissolves it in every proportion without decomposing it; it is not crystallizable.

It is not affected by the diluted sulphuric acid; it is decomposed and changed by the concentrated acid.

It is dissolved in the nitric acid, whether hot or cold, and acquires a fine red colour; by continuing the action of the acid, the colour is converted into a yellow; nitrous fumes are disengaged, and crystals of oxalic acid are formed; no yellow bitter substance is produced.

The muriatic and phosphoric acids dissolve without effecting any decomposition of it; on saturating the acids the emetic matter is obtained.

The acetic acid is one of the best solvents of the emetic matter. The gallic acid, on the contrary, precipitates it from

its solution in water, alcohol forming with it the most intimate union. The abundant and flocculent precipitate which is formed, is of a dirty white; is little soluble; yet a small quantity remains in the liquor. The emetic matter, by this combination, is deprived of its emetic properties, as we shall have occasion to remark, when we come to explain the action of this emetic matter on the animal economy. The aqueous and alcoholic tincture of nut galls forms likewise, with this matter, a very abundant precipitate. The tartaric and oxalic acids do not act on the emetic matter; the diluted alkaline solutions produce no action on the emetic matter; but it is destroyed by the concentrated alkalies.

The alkalies dissolve the precipitate formed by the nut galls and gallic acid with the emetic substance. A solution of iodine in alcohol, poured on the alcoholic tincture of the emetic substance, produces a red precipitate, which appears to be a combination of iodine and the emetic substance. The small quantity which we could obtain of this precipitate, did not admit of a thorough examination.

Of the salts which we mixed with the emetic substance, none exerted a stronger action than the acetate of lead; a very abundant precipitate is formed, especially when the subacetate of lead is employed. When the experiment is made with the acetate of lead of commerce, which contains more acid, the precipitate is not so abundant, and the supernatant liquor remains slightly coloured. Hence it appears, that the acetic acid prevents the precipitation.

The protonitrate of mercury at first exerts no action on the emetic substance, but after some time a slight precipitate is formed.

The deuto-chlorine of mercury occasions a rather greater precipitate. The precipitate formed by the muriate of tin is likewise in small quantity. The ferruginous salts produce no effect on the emetic substance, when it is deprived of the gallic acid.

The antimoniated tartrate of potash does not act on the emetic substance; a very interesting fact, as these two articles are frequently administered together.

The decoction of cinchona produces a slight precipitate

from a solution of the emetic substance; but the precipitate is not to be compared in quantity with that produced by the infusion of nut galls.

Vegetables do not act on the emetic substance; the same is true of sugar, gum, gelatin, and other vegetable and animal substances, employed in these experiments. Others do not dissolve the emetic substances. In the course of the memoir we shall treat of its action on the animal economy.

On reviewing the properties of the emetic substance of ipecacuanha, we are induced to consider it as a substance sui generis. From the numerous experiments we have made to separate its several principles, the emetic properties, the effect produced by the gallic acid and nut galls, from the whole assemblage of these properties we are inclined to consider it as a specific substance, a constituent principle in vegetables; the more especially as we have found it in emetic plants, belonging to different families, in the *Callicoca ipecacuanha*, in the viola emetica, &c. and if our experiments may be relied upon, it is entitled to be ranked in the nomenclature, and designated by the name of emetine (ἐμέω, vomo) which will indicate the remarkable property with which it is endowed, and the plant in which it was first observed, the psycotria emetica.

It remains that we should speak of the products furnished when water was employed as the menstruum, for dissolving the portion of ipecacuanha no longer soluble in ether or alcohol. When subjected to maceration at the common temperature, the water became mucilaginous, and by evaporation afforded a greyish matter; which being washed in alcohol was deprived of its colouring principle, and was recognised as the emetic substance already described. The white residuum possessed all the properties of gum, and by treating it with the nitric acid, oxalic acid and mucous acid were obtained.

After cold water had ceased to act, boiling water was employed, which dissolved a considerable quantity of a substance, which the authors found to be starch. A small quantity of iodine being added to the liquor, a fine blue colour was immediately produced.

Here, Messrs. Pelletier and Majendie close their chemical enquiries on the psycotria emetica, and consider what remain-

ed insoluble in the various menstrua employed as merely ligneous. They notice as a singular fact the intimate combination of the woody matter and the fecula, traces of which they discovered on the eighteenth boiling.

The mean average of several analyses afforded the following proportions in the first species of ipecacuanha.

Fatty and oily matter - - -	2
Emetic matter (Emetine) - - -	16
Wax - - - - - - -	6
Gum - - - - - - -	10
Starch - - - - - -	42
Wood, ligneous matter - - -	20
Loss - - - - - -	4
	100

The analysis of the meditullium of the same root, conducted in the same way, gave,

Emetic matter, (Emetine) - -	1.15
Extractive and non emetic matter -	2.45
Gum - - - - - - -	5.
Starch - - - - -	20.
Ligneous matter - - - -	66.60
Slight traces of fatty matter	
Loss - - - - - -	4.80
	100.

The non emetic extractive matter indicated in the above analysis, bears a strong affinity to the extracts obtained from most ligneous substances, and is very difficultly separated from the emetic substance, impairing the properties of the latter; it differs from the emetic substance in not being precipitated by nut galls, or the gallic acid, while the latter forms, as we shall explain more fully, abundant precipitates with these reagents; the small quantity of emetic substance contained in the ligneous meditullium proves the propriety of apothecaries separating the meditullium, in preparing the powdered ipecacuanha.

The grey ipecacuanha, the root of the *callicoca ipecacuanha* separated from the meditullium, and treated in the same way, afforded,

Fatty matter	2
Emetine	14
Gum	16
Starch	18
Ligneous matter	48
Wax, quantity not ascertained.	
Loss	2
	100

To complete the plan proposed by Messrs. Pelletier and Majendie, they instituted a number of physiological experiments with the several products; as no very striking properties could be attributed to the gum, starch, wax and ligneous matter, they confined their inquiries to the fatty matter and the emetine, which we shall give in the language of the authors.

"The fatty matter imparts an odour and flavour similar, but much stronger than the ipecacuanha in substance. Hence, it might be inferred, that its action on the stomach would be analogous, but this conjecture is not confirmed by experience. Pretty large doses were given to several animals, but no sensible effects were produced; we likewise swallowed several grains in repeated doses, but were sensible only of a disagreeable nauseous smell and taste, which was momentary. M. Caventou, who kindly assisted in these experiments, took six grains at a dose and did not experience more perceptible effects.

"Very different results were obtained with the *Emetine:* half a grain given to a cat excited considerable and long continued vomitings followed by deep coma, from which the animal did not recover for some hours.

"This experiment was repeated on several other cats and several dogs, with nearly similar doses of the emetine; the results were similar, that is, there was always vomiting in the first place, then coma, after which the animal was restored to perfect health in a longer or shorter period."

The authors repeated these experiments on themselves and with similar results.

Since this period the emetine has been administered as an emetic to several patients; all experienced the effects usually obtained from ipecacuanha, without being disgusted with the disagreeable smell and taste of ipecacuanha; for the emetine is devoid of smell, and the taste is only slightly bitter.

Messrs. Pelletier and Majendie did not confine their inquiries to the foregoing experiments, they wished to ascertain whether the emetine administered in larger doses would induce any inconvenience.

For this purpose 12 grains of emetine were given to a small dog, about two years old; at the end of half an hour the vomiting came on, and continued for a long time. The animal became comatose, but instead of reviving as in the animals mentioned above, it died the following night about 15 hours after the emetine had been administered.

On examining the body the next day, it appeared that the animal had died of a violent inflammation of the substance of the lungs, and of the mucous membrane of the intestinal tube extending from the cardia to the anus.*

The experiment repeated on several other animals, with only six grains of the emetine, afforded similar results. The same occurred in several dogs, in whom the emetine, dissolved in a small quantity of water, was injected into the jugular veins, within the pleura and anus, or introduced into the substance of the muscles; in all, the results were similar; first, long continued vomiting, consequent coma, and death within twenty-four or thirty hours after the experiment. On opening the body, inflammation of the lungs and mucous membrane of the alimentary canal.

These experiments show that the emetine cannot be administered in large doses with impunity; and that the practitioners who consider it as indifferent whether the ipecacuanha is taken in large or small doses, are under a mistake; for its action is not limited to the excitement of vomiting, as is generally supposed.

* These appearances are similar to those observed from poisoning by emetics. See Majendie's Memoir on Emetics.

The authors likewise remark, that the action of the emetine on the lungs and the intestinal tube, justifies the practice of exhibiting ipecacuanha in small and reiterated doses in defluxions from the lungs, in chronic catarrhs, long continued diarrhœas, &c. From this practice, in several persons affected with these disorders, they have established, that the emetine administered in regulated doses, was attended with more certain and constant effects than the ipecacuanha, and they give many cases in confirmation.

The experiments repeated with the emetine obtained from different kinds of ipecacuanha, produced the same effects, which demonstrates that this product is identically the same in all, and that it ought to be considered as a constituent of these plants.

From the results obtained by Messrs. Pelletier and Majendie they conclude; 1st. that there exists in common ipecacuanha, whose analysis has been given, a particular substance which they term emetine, to which these plants owe all their medicinal properties; 2d. that this substance is emetic, and exerts a peculiar action on the lungs and the mucous membrane of the intestinal tube, and proves likewise narcotic; 3d. that the emetine may be substituted for ipecacuanha in all cases when this article is employed, with this advantage; that in definite doses it has constantly the same effects, which is not strictly the case with the ipecacuanha of the shops, and that its being devoid of taste and smell gives it a decided preference when employed as a medicine.

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Account of the fatal Accident which happened in the Leadhills Company's Mines, the 1st March, 1817. By Mr. James Braid, Surgeon, Leadhills.

[From the London Medical and Surgical Journal, for October, 1817.]

On 1st March last, I was sent for, about seven o'clock A.M., to try if any thing could be done for a number of men, who were found in the Leadhills Company's mines, who appeared to be suffocated.

On the 30th December, 1816, a young man, who kept a fire-engine nearly 600 feet below the surface, was found dead, and the air where he was not to be at all agreeable:—the usual modes of resuscitation were tried, but without any good effects.

On the 24th of February, 1817, there were several men very severely affected from the bad state of the air, but by giving them gentle laxatives, and keeping them quiet, they got pretty well again in the course of a few days.

On the 1st of March, none of the men had got to bank when I arrived, except a few who had been down only a very short time, and returned upon finding the air so bad. By and by, a number of those who had been down for a short time, at 25 fathoms, were brought up, and most of them quite furious. Some were disposed to fight; others, supposing every one they saw disposed to lay hands on them, made efforts, under the most extreme terror, to escape; others, quite listless, appeared to take no notice of what was going on around them. Some were singing, and some praying. Many were as if intoxicated with ardent spirits: those who had seen them in that state assured me their actions were very much the same.

Many of them vomited, and others had the inclination, but could not do so. Some evacuated the contents of the rectum,

and others had the desire without effect. The pulse was different—in some remarkably quick and feeble; in others slow, feeble, and irregular. Most complained of insufferable headach, which was somewhat relieved after vomiting. To those who had a desire to vomit without effect, I gave an emetic of sulphate of zinc; and to those troubled with tenesmus, a laxative glyster: both were followed by an alteration of symptoms.

In the course of two or three hours from the time they were brought to bank, the pulse was greatly accelerated, and hard. I prescribed a brisk purgative, after the operation of which they found themselves greatly relieved; and, by enjoining a cooling regimen, most of them got pretty well, in the course of a few days, without any other medicines. Upon inquiring of the men how it affected them, they said they first felt a difficulty of breathing, and had frequent involuntary deep inspirations—then a violent pain and beating in the head, with ringing of the ears—the inferior extremities became weak, and very painful immediately above the knees, and they could with difficulty support the body—the heart palpitated violently—great anxiety, and in some followed by vomiting. They now became giddy, and lost all recollection, and were, as has been remarked, affected as if they had taken a large dose of ardent spirits.

There were four men, however, at 25 fathoms, who were irrecoverably lost through their own imprudence of going to work at irregular hours. Though six o'clock A. M. was the proper hour, two had gone before four, and other two a little after, in order that they might get out so much sooner. Such practices are not sanctioned by the masters. When they came to the bad air, they had thought to force their way through it, expecting it would be better below; but it had soon produced its deleterious effects upon them, so as to make them unable, either to go further, or to retrace their steps; and then, unable to support themselves, they had fallen, and remained amongst the bad air till assistance came too late. Animation must have been gone two or three hours before they were brought to bank, for they had been down not less than four hours. Had they not gone till the regular shift, when the air was found to be so bad, they would not have proceeded so far; and, if one

or two had fallen, the others would have found some means to have rescued them, before they had been irrecoverably gone. It is presumed, the accident happened from a quantity of smoke escaping from the chimney of the engine under ground into the way-gates, about the twenty-five fathoms, and so contaminating the air in the workings, from the quantity of sulphurous acid gas which the smoke contained, such as to render it unfit to support animal life, or rather, highly deleterious. The men described the air to be the same as where sulphur is burning slowly, and, consequently, sulphurous acid gas forming.

At the time the accident happened, the atmosphere was foggy, and there was a want of a proper current of air in the workings; and, in consequence of the stagnation, the air in that part of the way-gates, where the smoke was escaping, became so contaminated, by sulphurous acid gas, as to render it highly deleterious to animal life. A trap-door being opened, in order to save those who were still alive, about the twenty-five fathoms, (that is, those who went at the time for a regular shift, the four who had gone in before were dead when these men went to them,) and to enable others to give them assistance, with safety to themselves, the bad air immediately rushed down to the lower workings, and began to exert its deleterious effects upon those at eighty fathoms, who were effecting their escape by another shaft. All who were any length of time in this situation were violently affected in the manner already mentioned, and three (two of whom went down to save others) perished at the eighty fathoms, from the air all below the forty fathoms becoming so bad, as to render it imprudent, or rather impossible, for any person to go down to their assistance; and, by this time, they were unable to assist themselves. Those in this situation were drawn up by an engine, and the last who got on the rope, from the others, either, by this time, not being able to secure him properly, or not having time to do so, from him giving the signal too soon, fell from the rope, after he was within twenty fathoms of bank, and was thrown into the landing-box of the water-engine, which threw the water from the landing-box (which is situated at the fifty fathoms) to the bottom of the shaft, so that it had forty fathoms to fall. Water was also thrown from the top,

with buckets, before the engine-water was diverted by this poor fellow tumbling into the landing-box. The water, by falling down the shaft, caused a circulation of air, and likewise, by absorbing the sulphurous acid gas, improved the air so much, that one who had lain at the side of the shaft, in an insensible state, for more than an hour, was restored. Other two, who were only at a very little distance from him, but were by so much further from the shaft, and consequently where the air could not be so much improved by the water-fall, were brought up immediately after him; but, though the usual modes of resuscitation were tried, neither of them could be restored. One of these last had had a very florid countenance. I took away a considerable quantity of blood from the jugular vein.

Those of a plethoric habit were much sooner, and more violently affected, than those of a spare habit; and, from what I saw, I make no doubt but one of a spare habit might remain in some degree active, whilst one of a very plethoric habit would be irrecoverably lost. When it becomes necessary for men to go into such situations, would it not be proper to take away a quantity of blood from those of a plethoric habit? I shall certainly be disposed to try it, if ever the air shall again become bad.

The candles burnt, though faintly, where the men perished, which was generally considered as an extraordinary thing; and the only hypothesis which I can conceive proper to be advanced on the subject, is, that, in a mixture of sulphurous acid gas and atmospheric air, the acrid nature of the sulphurous acid gas prevents respiration, or rather produces peculiarly deleterious effects, which, continued a certain length of time, will destroy animal life; whilst it has no further effect on combustion, than merely mechanically preventing the more free supply of oxygen it would have from pure atmospheric air, and, consequently, causing it to burn more faintly.

Proceedings of the Academy of Sciences of the Royal Institute of France.

[From the Journal of Science and the Arts, No. V. and VII.]

M. Desfontaines read a report on a note of Mons. Virey, respecting the real nature of the *ergot* of rye, which he asserts to be a disease of the grain, and not a parasitic plant, as mentioned by Decandolle. Mons. Desfontaines, after giving the description of the ergot, enters into some elaborate researches respecting its growth, real nature, and external character, detailing, at the same time, the experiments made by Mons. Vauquelin, upon that substance. The reporter likewise details the opinion announced sometime ago, by Mons. Decandolle, that the ergot was a champignon, to which he had given the name of *sclerotium*, and that the seed of this parasitic plant was absorbed by the rye, and germinated afterwards. But facts, the reporter might have added, are not in support of this theory, and experience as well as experiments, prove the contrary to be the case. The report concludes with saying, "that although we do not reject altogether Mons. Decandolle's opinion, the experiments, and every other circumstance, must naturally induce us to adopt M. Virey's way of thinking on the subject." To the differences existing between the *ergot* and the *sclerotium*, mentioned by Mons. Desfontaines, M. P. Beauvois added, from his own observation, that there is another apparent character in the two substances, which alone would suffice to distinguish them from each other. This is the facility with which the grain of the *ergot* is detached from the plant; its friability, *pour ainsi dire;* whereas the *sclerotium* is horny, difficult to be cut, and not readily moved from the plant to which it adheres. He also stated having seen a plant, the lower part of which preserved its identic nature, while the upper half was *ergoté*.

Mons. Hazard suggested, that another means of ascertaining the difference between the *ergot* and the *sclerotium*, would be to institute some experiments on the effects of the latter on the animal economy, and to compare them with those which the *ergot* has been known to produce.

Mons. Portal read a memoir containing some considerations on vomiting. Dr. Majendie endeavoured sometime ago to show, that the stomach in vomiting is nearly passive, and that the diaphragm and abdominal muscles are the only agents in that phenomenon. In some of his experiments, Dr. Majendie had even pushed the demonstration so far, as to substitute a bladder in place of the stomach, (which had been removed in a dog) when by exciting the action of the above named muscles, vomiting was produced; i. e. the ejection of the coloured liquid contained in the bladder. Dr. Portal now comes forward with other experiments to prove that Dr. Majendie's general assertion was too hasty—that vomiting begins by a particular action of the stomach, as commonly supposed by physiologists in general, and is further continued by the action of the abdominal muscles and diaphragm, but, that in many cases, the latter are by no means necessary, as he states having ascertained, that vomiting may be produced in the stomach, where the abdominal parietes have been removed, a fact which he had occasion to observe in an experiment made for that purpose.

Royal Institution of Great Britain.

Among other matters of interest which have been produced at these meetings, we cannot omit noticing the experiments upon congelation, by means of absorbents, made by James Stodart, Esq., in consequence of a communication from Professor Leslie, of Edinburgh.

The process of producing ice, or freezing water, under the receiver of an air pump, by exposing it to the absorbent powers of concentrated sulphuric acid, has long been known, and this experiment induced a supposition, that pipe clay and other absorbent earths, might produce a similar effect: accordingly, this and the trap rock, of Calton Hill, near Edinburgh, were tried by Professor Leslie, and found to answer the purpose. In the progress of his experiments, he observed, that the common coarse Scotch oatmeal, when dried before a fire, or in a kiln, but not over heated, was powerfully absorbent, and on being applied to the same purpose, answered most effectually.

A tin case of this, and another of the Calton Hill trap rock, previously dried and soldered up, were forwarded by Professor Leslie to Mr. Stodart, and with these, the experiment above mentioned was tried, with a powerful and excellent air pump, belonging to Mr. Leslie, which has three plates. Three substances were made use of, viz. the above oatmeal, trap rock, and dried tobacco pipe clay, disposed in common dinner plates. The water was contained in small unglazed Wedgewood pans, 3 inches deep each, while the water in them was half an inch deep. These pans were supported upon wire frames, a small distance over the absorbents, and a small thermometer was placed in each. In this state, they were covered with hemispherical glass receivers, and on working the pump, and producing a good vacuum, the water over the oatmeal became a solid cake of ice in eleven minutes; that over the trap rock in 13 minutes, and that over the pipe clay, shot into crystals of ice in about the same time, but did not entirely freeze. This was in June, and the thermometer in the room was at 67.

Chemical Nomenclature.

[From the Port Folio, for April 1817.]

M. Ampere, a French philosopher, has published a sensible dissertation on the subject of a new arrangement of the chemical bodies, which is supposed to be necessary, in consequence of the late discoveries in that important branch of human knowledge. (*i. Ann. de Chim. et de Phys.* 295. 373. *et ii.* 5. 105. (He examines the properties of all the simple bodies, with great acuteness and perspicuity, and endeavours to form them into a natural system, in which they follow in a consecutive series, according to their several properties. Our limits restrict us to a mere outline of his classification.

Class i. Gazolytes.

Genus 1. Borides. (From *boron.*)

*Bodies forming permanent Acid Gases with Phthore.**

Sp. 1. Silicon. Sp. 2. Boron.

* The hypothetical body called fluorine by Sir H. Davy.

Genus 2. ANTHRACIDES. (From ανθραξ.)

Bodies combining with one of the Elements of Air, when exposed to it at a sufficient temperature, and forming permanent gases with the other element.

Sp. 1. Carbon. Sp. 2. Hydrogen.

Genus. 3. THIONIDES. (From θειον.)

Bodies capable of uniting with the preceding genus, and of forming gaseous or very volatile compounds.

Sp. 1. Azote. Sp. 3. Sulphur.
2. Oxygen.

Genus 4. CHLORIDES, (From *Chlorine.*)

Bodies unalterable in the air, at all temperatures, forming with hydrogen acid compounds, gaseous or very volatile.

Sp. 1. Chlorine. Sp. 3. Iodine.
2. Phthorine.

Genus 5. ARSENIDES. (From *Arsenic.*)

Bodies oxidated in the air, when exposed to it at a sufficient temperature, forming solid compounds with oxygen, and permanent gases with hydrogen.

Sp. 1. Tellurium. Sp. 3. Arsenic.
2. Phosphorus.

CLASS II. LEUCOLYTES.

Genus 1. CASSITERIDES. (From κασσιτερος.)

Bodies whose combinations with oxygen are decomposed by carbon, but not by iodine.

Sp. 1. Antimony. Sp. 3. Zinc.
2. Tin.

Genus 2. ARGYRIDES. (From αργυρος.)

Bodies whose oxydes are decomposed by iodine and hydrogen.

Sp. 1. Bismuth. Sp. 3. Silver.
2. Mercury. 4. Lead.

Genus 3. TEPHRALIDES. (From τεφρας and ἁλς.)

Bodies whose oxydes are decomposed by iodine, and not by hydrogen.

Sp. 1. Sodium. Sp. 2. Potassium.

Genus 4. CALCIDES. (From *Calcium.*)

Bodies whose oxydes are not decomposed by carbon or iodine, but by chlorine.

Sp. 1. Barium.
2. Strontium.
3. Calcium.
4. Magnesium.

Genus 5. ZIRCONIDES. (From *Zirconium.*)

Bodies whose oxydes are not decomposed by chlorine, iodine, or carbon.

Sp. 1. Yttrium.
2. Glucinium.
3. Aluminium.
4. Zirconium.

CLASS III. CHROICOLYTES.

Genus 1. CERIDES. (From *Cerium.*)

Bodies brittle and infusible at the temperature at which iron melts.

Sp. 1. Cerium.
2. Manganese.

Genus 2. SYDERIDES. (From σιδηρος.)

Bodies whose oxydes dissolve in acids in a state of purity, and form coloured solutions, only when concentrated, and whose peroxydes have not acid properties.

Sp. 1. Uranium.
2. Cobalt.
3. Iron.
4. Nickel.
5. Copper.

Genus 3. CHRYSIDES. (From χρυσος.)

Metals unalterable in the air at all temperatures.

Sp. 1. Palladium.
2. Platinum.
3. Gold.
4. Iridium.
5. Rhodium.

Genus. TITANIDES. (From *Titanium.*)

Infusible bodies whose pure oxydes do not dissolve in acids, and do not form with the alkalies compounds which can be considered as true salts.

Sp. 1. Osmium.
2. Titanium.

Genus 5. CHROMIDES. (From *Chromium.*)

Bodies infusible at the temperature at which iron melts, acidifiable by oxygen.

Sp. 1. Tungsten.
2. Chromium.
3. Molybdenum.
4. Columbium.

External Application of Sulphurous Acid as a Remedy.

[From the Annals of Philosophy, for October, 1817.]

Dr. De Carro, of whose ardent and successful attempts to propagate the vaccine inoculation in Austria we lately made honourable mention in a biographical sketch which appeared in our Journal, is now eagerly employed in prosecuting a set of experiments at Vienna to ascertain the value of sulphurous acid fumes externally applied, according to the method of Dr. Galès, of Paris, as a remedy in different diseases. Dr. De Carro has distributed amongst his friends the following short account of his institution:

"Although the utility of sulphur, taken internally, applied by friction, and mixed with natural and artificial baths, in many chronic diseases of the skin, the joints, the glands, and the lymphatic system, has been acknowledged from time immemorial, the most enlightened physicians have long desired some mode of administering the vapour of this mineral rendered acid, and more penetrating by combustion; and this wish was particularly expressed by a great physician of this capital, J. P. Frank, in his Epitome de curandis Hominum Morbis, Cap. Psora.

"Many contrivances more or less perfect, have been adopted at different times for the employment of the sulphurous acid fumigation; but none of them till the present have been so managed as to admit of being used without affecting the respiratory organs.

"At length, however, Dr. Galès, of Paris, has invented and brought to perfection a Boëte Fumigatoire, which appears to answer every purpose; and the success of which, since the year 1813, would appear almost incredible, were it not attested by the principal civil and medical authorities of Paris, and fully detailed in a memoir* published in 1816, and distributed by order of the French government.

"Dr. Galès, who has obtained an exclusive privilege for this

* Memoire et Rapports sur les Fumigations Sulfureuses appliquées au Traitement des Affections cutanées et de plusieurs autres Maladies. Par J. C. Galès, Docteur en Médecine de la Faculté de Paris, &c. Imprimés par Ordre du Gouvernement. De l'Imprimerie Royale. Paris, 1816.

practice in the capital, and, as a national recompense, a pension for life of 6000 francs, has in his own house 26 sets of apparatus, for all of which he finds employment; and similar establishments, public and private, are daily multiplying throughout France.

"Struck with the great advantages of this remedy, I have established an institution for its exhibition, after having obtained the consent of the Imperial Government of Lower Austria, who have inspected the situation and the plan. I have devoted four chambers, containing two sets of apparatus, one for females, and the other for males, provided with proper attendants for each sex. The number of chambers, and the extent of the apparatus, will be increased according to its success. In order to be the more secure, and to avoid the difficulties inseparable from an imitation, I have procured the apparatus from Paris, constructed under the direction of Dr. Galès.

"The employment of the fumigation will never be left to the discretion of the patient; and no one will be admitted until he has consulted me, either alone, or in concert with other medical men.

"Wishing to facilitate beyond the capital, and in foreign countries, the adoption of this remedy, I shall always have, according to the example of Dr. Galès, sets of apparatus, made under my own eye, for those who require them; and these will be accompanied with small explanatory models, capable of being taken to pieces, in order to point out exactly the disposition of the different parts."

(Signed) De Carro, M. D.

Vienna, July 15, 1817.

Process of M. Robiquet for the Preparation of Morphium.

A concentrated infusion of opium is to be boiled with a small quantity of common magnesia for a quarter of an hour. A greyish deposit in considerable quantities is formed: this is to be filtered and washed with cold water, and when dry acted on by weak alcohol for some time at a temperature beneath ebullition. In this way very little morphium, but a great quantity of colouring matter is separated. The solid matter is then to be filtered, washed with a little cold alcohol, and afterwards boil-

ed with a greater quantity of highly rectified alcohol; it is to be filtered whilst hot, and the spirit on cooling deposits the morphium in crystals, and very little coloured. This is to be repeated three or four times with the residuum, and the morphium obtained by each filtration, is less and less coloured.

List of Patients admitted into all the Civil Hospitals of Paris, from the 1st to the 30th of July, 1817, both inclusive.

Uncharacterised fevers	27
Intermittent ditto, various	206
Bilious or gastric ditto	243
Adynamic or putrid ditto	10
Catarrhal ditto	9
Phlegmasiæ, internal and external	80
Ophthalmia	23
Rheumatism	32
Diarrhœa and dysentery	13
Erysipelas	13
Phlegmasiæ of the organs of respiration	79
Consumption	36
Apoplexy and recent paralysis	16
Dropsy and anasarca	43
Small-pox	14
Metallic colics	10
Sporadic and chronic disorders, and the result of accidents	218
Itch	79
Total	1151

List of Patients admitted into all the Civil Hospitals of Paris, from the 1st to the 31st August, 1817, both inclusive.

	From August 1st to 10th	20th	31st
Uncharacterised fevers	11	12	5
Intermittent ditto, various	69	63	64
Bilious or gastric ditto	61	72	67
Adynamic or putrid ditto	6	18	8
Catarrhal ditto	0	0	1
Carried forward	147	165	145

brought forward,	147	165	145
Phlegmasiæ, internal and external - -	46	26	25
Ophthalmia - - - - - -	9	7	4
Rheumatic pains - - - -	14	14	11
Diarrhœa and dysentery - - -	3	5	7
Erysipelas - - - - - - -	0	4	4
Phlegmasiæ of the organs of respiration	0	30	29
Phthisis - - - - - - -	10	12	17
Dropsy and anasarca - - -	14	19	10
Apoplexy and recent paralysis - -	0	3	4
Variolous - - - - - -	1	7	6
Metallic colics - - - - -	5	4	3
Sporadic and chronic disorders, and accidents	56	76	60
Itch - - - - - - - -	27	35	20
	332	407	345

Meteorological Report.

From July 1st to	10th	20th	30th
Maximum of barometer	28.2 $\frac{7}{12}$	28.2 $\frac{1}{12}$	28.3 $\frac{7}{12}$
Minimum of ditto	27.11 $\frac{6}{12}$	27.7 $\frac{3}{12}$	28.0 $\frac{4}{12}$
(centigrade.)			
Max. of thermometer	20°	19°	21°.9
Min. of ditto	12°.9	10°	10°
Max. of hygrometer	97°.2	98°	91°
Min. of ditto	84°	87°	87°

CHEVALLIER, Optical-Engineer.

On Poisoning with Arsenic; by JAMES KERR, Esq.

[From the London Medical and Physical Journal, for August, 1817.]

READING in the newspapers, in April last, an account of the very important trial of a surgeon, at Falmouth, on a charge of murder, I anxiously waited in expectation of seeing, in your valuable Journal, some remarks on a case in which the medical public is so much interested. But, as nothing has appeared except a notice of it under the head of Medical Intelligence, containing nothing conclusive, and in which the experiments of Dr. Neale are not mentioned, I beg to submit to your readers a few remarks on the subject.

As the circumstances of the case may not be known to all your readers, I shall briefly state them. A surgeon, practising

at Falmouth, was indicted for poisoning his mother-in-law, by giving her arsenic. The principal witness for the prosecution was Dr. Edwards, of the same town, who, amongst other particulars, stated, that, upon trying the contents of the stomach with the test of sulphate of copper with carbonate of potash, a green precipitate took place; and on trying another portion with carbonate of potash and nitrate of silver, the yellow precipitate so well known was the result; that he had not a sufficient quantity to attempt the re-production of metallic arsenic, but he was quite satisfied with these experiments as determining the existence of arsenic.

Fortunately for the prisoner, Dr. Neale, of Exeter, was examined as a witness, who stated that he did not consider the above experiments as at all to be relied on, and then related the result of two experiments which appeared completely to invalidate those of Dr. Edwards, and, no doubt, considerably influenced the jury in their decision.

Dr. Neale also stated that he thought nothing short of the re-production of metallic arsenic could be satisfactory. Dr. Neale's experiments were as follow:

1st. To a solution of sulphate of copper a small quantity of decoction of onions was added; a solution of phosphate of soda dropped into this mixture, produced a green precipitate very much resembling the Scheele's green.

2d. To a solution of phosphate of soda was added some decoction of onions: on applying the nitrate of silver, a yellow precipitate took place, resembling that which occurs, when a solution of arsenic is used.

There is one circumstance connected with the case of the deceased which greatly adds to the merit and applicability of these experiments, and that is, the deceased had dined on rabbit and *onion-sauce* a few hours before her death; and, as many of the animal fluids contain phosphate of soda, we readily perceive the source of each substance from which the analogy was taken.

A few days after reading the account of this interesting trial, I went over the experiments of Dr. Neale, and repeated them before three medical friends of this town, the results of which, with some observations, I shall now state.

In Dr. Neale's first experiment, I found the green precipitate so exactly resembling that from a solution of arsenic, that I was induced afterwards to repeat it on a larger scale, so as to obtain a small lump of it in a dried state, and then the resemblance to the Scheele's green was remarkably striking. In his second experiment the result is so much like that made with arsenic, that it would puzzle most people to distinguish them; if there be any difference, it is that, when the phosphate of soda is employed, the precipitate is of a more beautiful sulphur colour than when arsenic is used. It may be proper to mention, that, in this experiment, the decoction of onions is not at all necessary, its addition or omission making no difference in the colour of the precipitate; but, in the first experiment it is indispensable, the peculiar green precipitate not taking place till it be added.

As a further elucidation of the subject, I took the lump of green precipitate before mentioned, and laid it on a red hot iron, holding over it a plate of polished copper: it soon became a black cinder, without at all affecting the copper. On substituting a lump of arsenite of copper, or Scheele's green, white fumes are exhaled, and the copper plate is immediately covered with a white coat, in the same manner as when white arsenic is employed.

The conclusions to be drawn from these experiments appear to me to be of considerable importance to the public in general. We now see two experiments, which, though not considered quite conclusive, were thought to be strongly corroborative, rendered completely nugatory. In your Journal for December, 1815, is a paper by Mr. Crowfoot, in which, after trying the two experiments made by Dr. Edwards, and that with the copper plates, the writer says, "From the whole, therefore, though every experiment produced conviction of the fact, it may be useful to state that the weakest proof was that by the action of heat, and the strongest and most decisive by the *admirable test of Mr. Hume*." Yet who will place confidence in this test in future? I hope this will not be understood as any censure of Mr. Crowfoot. So far from any intention of that kind, I take this opportunity of stating that I read Mr. Crowfoot's communication at the time with great plea-

sure, and had not the least doubt of its accuracy. What surprises me is, that Mr. Hume and other excellent chemists should not have been acquainted with the fact, that phosphate of soda produces with the nitrate of silver the same beautiful yellow precipitate that arsenite of potash does. In searching for information on this subject, I found, in your Journal for 1816, under the head of Medical and Physical Intelligence, that "an ingenious student at Guy's Hospital" had suggested this fact to Dr. Marcet; but, what is very curious, he goes on to say, "Yet in juridical cases other tests may be requisite to be assured of the presence of arsenic. The addition of sulphate of copper and potash, and the formation of Scheele's green, affords *a very satisfactory confirmation.*" After the first experiment of Dr. Neale, I am inclined to think this "ingenious student" will have his confidence shaken in this test as well as in the other. In consulting the celebrated work of M. Orfila on Toxicology, I cannot find that he was acquainted with either of these facts. In a note to page 113, of vol. I. part I. he says, "It may readily be conceived that the nitrate of silver lately proposed by Mr. Home (Hume) for discovering the arsenious acid, ought to be a very uncertain test in a great number of cases. In fact, if the quantity of arsenious acid mixed with the aliments is very small, and these contain muriates, there ought to be formed, at the same time, a small quantity of arsenite of silver of a yellow colour, and a great deal of muriate of silver of a white; in such manner that the precipitate would appear of this last colour, whilst it ought properly to be yellow." Here it is evident that, had M. Orfila known that phosphate of soda would produce the same yellow precipitate, he would have mentioned it. Nor can I find any mention of a green precipitate produced in any way, but by the help of arsenious acid, or white arsenic.

I have thus endeavoured to show how much obligation we are under to Dr. Neale; for, although previous mention was made of the yellow precipitate, I believe he was the first to inform us, that an apple-green precipitate resembling the arsenite of copper or Scheele's green, could be produced without the existence of arsenic.

Great Yarmouth, June 12, 1817.

VACCINATION.

Agreeably to the provisions of an ordinance of the city councils, passed June 5, 1816, for the gratuitous vaccination of persons in indigent circumstances, residing within the city of Philadelphia, five physicians were appointed; who have reported that, from July 1st, 1816, to June 31st, 1817, they had successfully vaccinated nine hundred and six persons.*

DISPENSARIES.

The three Dispensaries have published statements of their proceedings during the last year, from which it appears, that the number of patients under the care of these institutions have been as follows:

Philadelphia Dispensary.

From December 1, 1816, to December 1, 1817,		3019
Cured - - - - -	2712	
Relieved - - - - -	60	
Dead - - - - -	87	
Irregular or uncertain - -	46	
Removed - - -	31	
Remaining under care - -	83	3019

Northern Dispensary.

From December 30, 1816, to December 1, 1817,		1480
Cured - - - - -	1208	
Relieved - - - - -	55	
Dead - - - - -	107	
Irregular or uncertain - -	41	
Removed - - - -	29	
Remaining under care - -	40	1480

Southern Dispensary.

From December 31, 1816, to December 1, 1817,		2497
Cured - - - - -	2040	
Relieved - - - - -	145	
Dead - - - - -	60	
Irregular or uncertain - -	207	
Removed - - - -	20	
Remaining under care - -	25	2497

Making a total of six thousand, nine hundred and ninety six patients.

* Eight hundred and thirty-four persons have been successfully vaccinated, in 1817, in the Northern Liberties and District of Southwark by the Physicians of the Vaccine Society.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia during the last six months of 1817.

July.

Thermometer—Lowest, at 9 A. M. 64. 25th of the month.
Highest, at 3 P. M. 87. 30th.
Mean, ... 78.

Winds variable—between east and west, most westerly.

August.

Thermometer—Lowest, at 9 A. M. 59. 25th of the month.
Highest, at 3 P. M. 86. 19th and 20th.
Mean, ... 75.

South and westerly winds most prevalent—heat much greater to the north-eastward, but little thunder and lightning here. A pleasant summer—warmer than the last. All the crops abundant, particularly hay, and well got in. Vegetables and fruit good. The fever prevalent at Charleston—unusual quantities of fish this summer on the coasts of New-England, and the news-papers filled with accounts of the appearance of a very large sea serpent in those parts.

September.

Thermometer—Lowest, at 9 A. M. 50. 31st of the month.
Highest, at 3 P. M. 84. 11th.
Mean, ... 70.

Westerly winds prevailed—refreshing rains through the summer. Fever at New Orleans—large ice islands met with the beginning of this month, on the banks of New-foundland.

October.

Thermometer—Lowest, at 9 A. M. 39. 30th of the month.
Highest, at 3 P. M. 68. 23d.
Mean, ... 55.

Winds, chiefly western—little rain—severe hurricane in the West Indies, 21st of the month—Fever at Savannah in Georgia, and at the Natches in Louisiana.

NOVEMBER.

Thermometer—Lowest, at 9 A. M. 31. 25th of the month.
Highest, at 3 P. M. 73. 12th.
Mean, ... 55.

Northerly and westerly winds most prevalent.

DECEMBER.

Thermometer—Lowest, at 9 A. M. 10. 21st of the month.
Highest, at 3 P. M. 54. 2d.
Mean, ... 40.

Winds westerly—very little snow—on the 21st inst. the thermometer at 10 A.M. in an exposed situation, stood at 10°. The season has been healthy in this city—a number of vessels arrived during the summer and autumn, crowded with German passengers, amongst whom there has been great mortality. No measles—small pox scarcely heard of at present. The typhus or hospital fever has been common in England and Ireland, during the last autumn. The plague has been epidemic in Algiers, and parts adjacent. The disease, generally called yellow fever, has been prevalent and mortal at Charleston, Savannah, New Orleans, and the Natches, during the last autumn—no appearance of it to the northward of Charleston, and no account of any other epidemic in the United States.

LIST OF RECENT EUROPEAN PUBLICATIONS.

MEDICINE, SURGERY AND ANATOMY.

The Edinburgh Medical and Surgical Journal, No. 57.

Observations on the Diseased Manifestations of the Mind or Insanity; by J. G. Spurzheim, M. D. with 4 plates, 8vo.

Surgical Observations; being a Quarterly Report of Cases in Surgery; by Charles Bell, Surgeon of the Middlesex Hospital; Part IV. 8vo.

A Compendious Dictionary of the Veterinary Art; by James White, Veterinary Surgeon, 18mo.

Pharmacopoeia Collegii Regalis Medicorum Londinensis 1809, Editio Altera, 18mo.

The Continental Medical Repository; conducted by E. Von

Embden, assisted by other Gentlemen of the Faculty, No. I. (to be continued quarterly.)

Remarks on Insanity: chiefly with reference to the Physical Symptoms, founded on the Practice of John Mayo, M. D. By T. Mayo, M. D. 8vo.

Picture of the College of Physicians, 8vo.

A Physiological System of Nosology. By J. M. Good, F.R. S. 8vo.

Delineations of the Cutaneous Diseases comprised in the Classification of the late Dr. Willan; by T. Bateman, M. D. F. L. S. Fasciculus X; with coloured plates.

Cases of Diseased Bladder and Testicle, with 21 Etchings; by W. Wadd, Esq. Surgeon, 4to.

An account of two successful operations for restoring the lost Nose, from the Integuments of the Forehead, By J. C. Carpue, Esq. with plates, 4to.

Observations on the Harveian Doctrine of the Circulation of the Blood; by A. Ewing, M. D. &c.

An Essay on the Mode by which Constitutional Disease is produced from the Inoculation of Morbid Poisons; by C. Salt, Member of the College of Physicians.

The New London Pharmacopœia correctly translated from the last Latin Edition; by R. J. Thornton, M. D.

Gerbaux on the Teeth, 12mo.

Medical and Miscellaneous Observations relative to the West India Islands, by John Williamson, M. D. &c. 2 vols. 8vo.

Botany.

A Practical Introduction to Botany with numerous Figures; by the Rev. M. Bingley.

Conversations on Botany, with 20 engravings, 12mo.

The Midland Flora; by J. Purton, 2 vols.

Natural History.

Outlines of Geology, being the Substance of a Course of Lectures, delivered in the Royal Institution; by Wm. Thomas Brande, 8vo.